I-35

I-35

Current Economic Analysis I-35

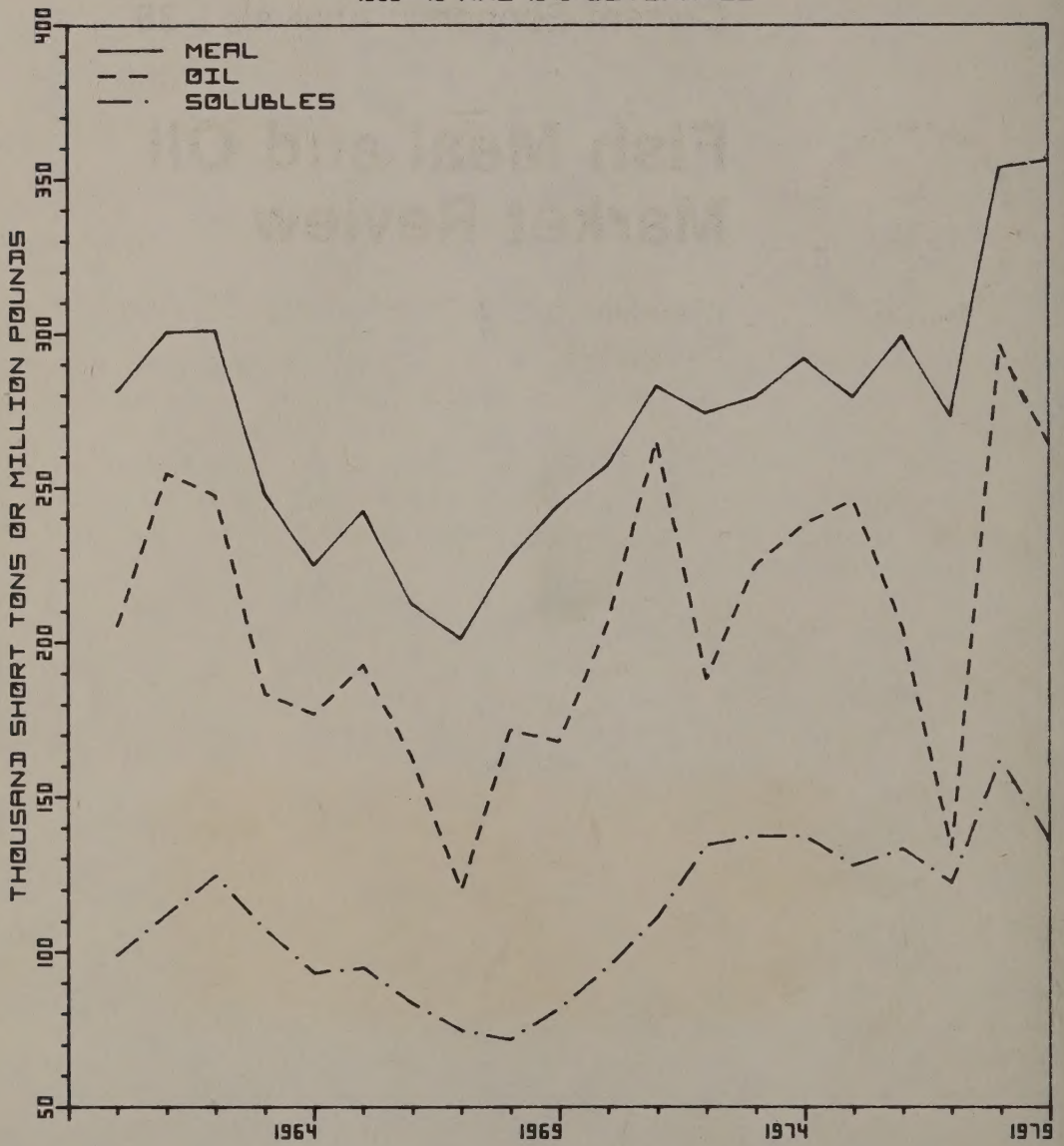
# Fish Meal and Oil Market Review

Washington, D.C.
January 1980

MAR 11 1980

**U.S. DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
National Marine Fisheries Service

U.S. PRODUCTION OF FISH MEAL, SOLUBLES, AND OIL, 1960–78 AND 1979 ESTIMATED




Note: Fish meal (excluding shellfish meal) and fish solubles in thousand short tons; fish oil in million pounds.

# FISH MEAL AND OIL MARKET REVIEW

U.S. DEPARTMENT OF COMMERCE
Philip M. Klutznick, Secretary

National Oceanic and Atmospheric Administration
Richard A. Frank, Administrator

National Marine Fisheries Service
Terry L. Leitzell
Assistant Administrator for Fisheries

Prepared by
Fisheries Development Division
John T. Everett, Chief

Industry Analysis Branch
John Vondruska, Chief

Principal contributor
John Vondruska
Phone: (202) 634-7353

Research Assistants
James S. Roberts
Henry Nichols

## CONTENTS

| | Page |
|---|---|
| Summary | 3 |
| Fish meal | |
| Review: January-October 1979 | 3 |
| Fish oil | |
| Review: January-October 1979 | 7 |
| Outlook | 10 |
| Statistical appendix | 11 |

## SUMMARY

U.S. production of fish meal, solubles, and oil was high in 1979, and could be high again in 1980. Eleven-month production of fish meal was ahead of 1978, which had record production. Production of fish solubles and fish oil was lower than in 1978. U.S. imports of fish meal improved in the first half of 1979, but slowed in the second half. Exports fell in 1979 from high year-earlier levels. U.S. exports of fish oil were high again in 1979.

World production and exports of fish meal and oil increased in 1979, judging by 9- and 10-month data for selected countries.

Prices of fish meal and oil seemed stable but weak in late 1979.

# FISH MEAL

## REVIEW: JANUARY-OCTOBER 1979

### U.S. Production High

U.S. production of fish meal was 337,000 short tons in January-October 1979, slightly ahead of a year earlier (table 1), when record production was achieved. Several factors contributed to the high production. Landings of menhaden, the dominant raw material, were high--down only 2 percent from a year earlier. Production of menhaden meal was down a bit less, only 1 percent, perhaps because relative prices offered an incentive to convert some solubles into meal, thereby helping to explain the steeper 12-percent decline in production of menhaden solubles (appendix table A-13). Among other meals, the largest boost to U.S. total production came from anchovy meal, whose output rose from low 1978 levels, although it remained below the 1973-77 average.

Table 1.--U.S. supply and use of fish meal (excluding shellfish meal), January-October, 1973-77 average, 1978, and 1979

| Component | 1973-77 average | 1978 | 1979 |
|---|---|---|---|
| | - - - Thousand short tons- - - | | |
| Production | | | |
| Menhaden 1/ | 189.4 | 270.1 | 267.6 |
| Anchovy | 12.9 | 0.8 | 8.3 |
| Tuna-mackerel | 34.3 | 40.1 | 38.7 |
| Unclassified | 21.6 | 21.6 | 22.5 |
| Total | 258.3 | 332.6 | 337.1 |
| Imports | 81.6 | 32.4 | 78.9 |
| New supplies | 339.8 | 365.0 | 416.0 |
| Exports | 27.9 | 46.2 | 14.2 |
| Net supplies | 311.9 | 318.8 | 401.8 |

1/ May include small quantities made from other species.

Figure 1.--U.S. IMPORTS AND EXPORTS OF FISH MEAL, QUARTERLY, 1976-79

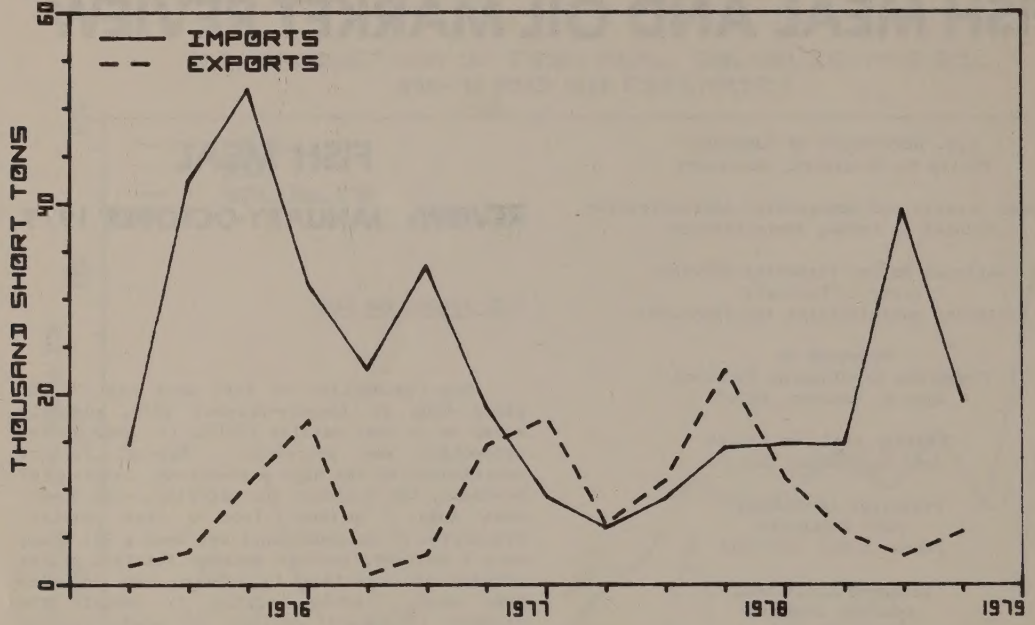
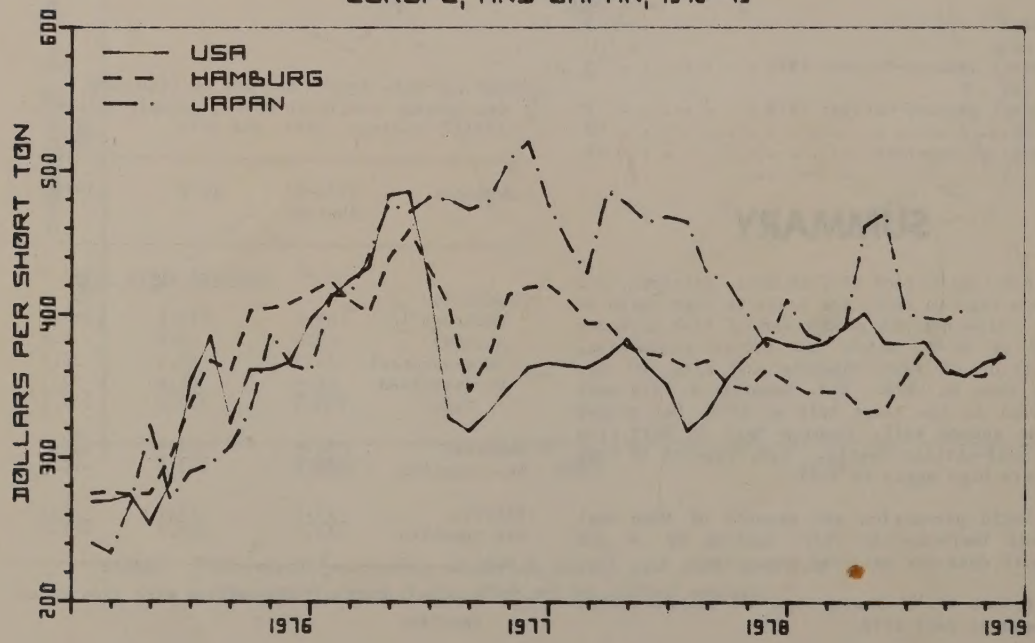



Figure 2.--PRICES OF FISH MEAL IN THE UNITED STATES, EUROPE, AND JAPAN, 1976-79



## U.S. Imports Up, Then Down

U.S. imports of fish meal, 79,000 short tons in January-October 1979, surpassed the low year-earlier level and approximated the 1973-77 average. Most of the gains were achieved in the first half, as imports in July-October 1979 were much closer to year-earlier levels, and below the 1973-77 average (fig. 1). The falling off appears to be price related. Representative prices of fish meal were markedly higher in the United States than in Europe from October 1978 to June 1979, but those prices were much closer together in July-November 1979 (fig. 2). The narrowing in price differentials coincided with the cessation of imports from Norway and Peru in the second half.

## U.S. Exports Low

The United States exported 14,000 short tons of fish meal in January-October 1979, about half the 1973-77 average and less than a third of last year's shipments. Shipments to the Federal Republic of Germany, normally our leading buyer, were low. More than two-thirds of the U.S. exports went to Egypt (appendix table A-5). Apparently, U.S. exports were kept low by the fact that U.S. prices tended to be either higher than European prices (October 1978 to June 1979) or about the same (July-November 1979). The decline in U.S. exports is not related to a falling off in foreign markets, because major importing countries purchased more fish meal in January-October 1979 than a year earlier (table 2). Their increased purchases came largely from the major exporting countries, whose supplies are up.

Table 2.--Imports of fish meal of selected countries, January-October, 1977, 1978, and 1979

| Country | 1977 | 1978 | 1979 |
|---|---|---|---|
| | - - Thousand metric tons- - | | |
| East Europe | 277 | 302 | 340 |
| Germany, Fed. Rep. | 225 | 198 | 222 |
| Japan | 147 | 76 | 90 |
| United Kingdom | 177 | 158 | 210 |
| United States | 68 | 29 | 72 |
| Total | 893 | 763 | 933 |

Note: Some data are estimated. The East European countries include Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, and Yugoslavia.

Table 3.--Supply and use of fish meal for six major exporting countries, January-October, 1978, and 1979

| Component | 1978 | 1979 |
|---|---|---|
| | - -Thousand metric tons- - | |
| Supply | | |
| Beginning stocks | 290 | 442 |
| Production | 1,380 | 1,554 |
| Total supply | 1,672 | 1,972 |
| Use | | |
| Exports | 951 | 1,224 |
| Domestic use | 215 | 216 |
| Total use | 1,166 | 1,440 |
| Ending stocks | 506 | 532 |

Note: Includes Chile, Iceland, Norway, Peru, and South Africa and Namibia (South West Africa).

## Major Exporters' Supplies Higher

Among major exporting countries, total production, exports, and stocks of fish meal were ahead of a year earlier in January-October 1979 (table 3). Since July 1978, their total stocks have tended to be higher than in September 1976 to June 1978. Those higher stocks have represented about 3 to 4 months of use (exports plus domestic use), compared with the 1964-79 average of 3 months.

## Prices--Weak

In the second half of 1979, the representative United States, European, and Japanese prices for fish meal (shown in figure 2) appeared to be in closer step than they had been since early 1977. United States prices adjusted most quickly to the increase in world supplies of high-protein meals in 1977, while Japanese and European prices made their downward adjustment more slowly. Prices of high-protein meals appear to be signaling another adjustment in relation to much larger expected growth in world supplies than in world demand in the 1979/80 crop year. This situation is less apparent in prices of fish meal than in prices of soybean meal, which accounts for a larger share of the world market for high-protein meals. First, a brief discussion of recent patterns of fish meal prices, and then more on the supply-demand picture for high-protein meal markets.

Figure 3.--PRICES OF MENHADEN MEAL AND SOYBEAN MEAL, 1976-79

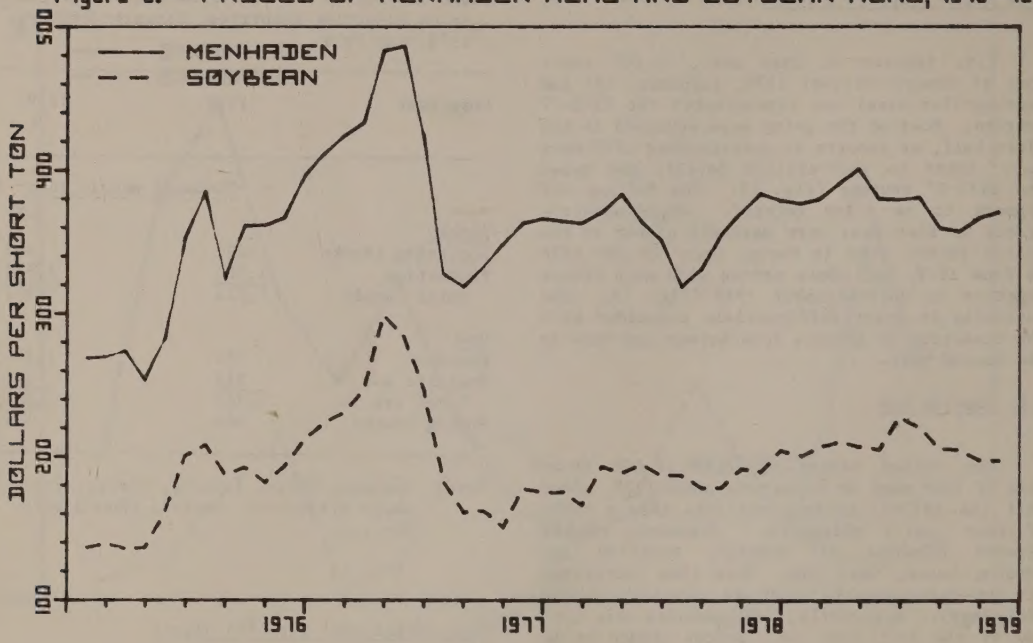
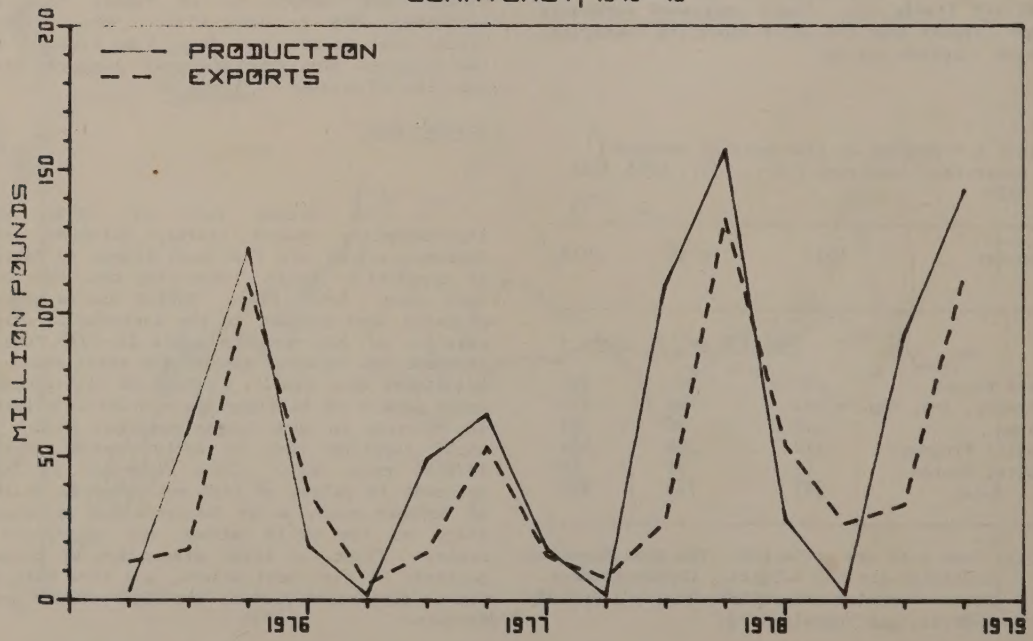



Figure 4.--U.S. FISH OIL PRODUCTION AND EXPORTS, QUARTERLY, 1976-79



Representative monthly average prices of fish meal for the United States and Europe were relatively close in July-November 1979, whereas U.S. prices were distinctly higher from October 1978 to June 1979 (fig. 2). United States prices rose seasonally since the year's low in September 1979. European prices had been moving downward from December 1977 through April 1979, but trended upward since then. Prices in Japan were also moving down from late 1977 to early 1979, but then stabilized in June-September 1979 (latest data available), when they averaged about $30 to $40 per short ton higher than prices in the United States or Europe (fig. 2).

While U.S. prices of menhaden meal rose seasonally since September 1979, they were slightly lower than a year earlier in October and November 1979, probably because of developments in world markets for major high-protein meals. Prices of soybean meal, which are used as an indicator for prices of major high-protein meals, moved downward from midyear to November 1979 (fig. 3), because of more rapid growth in world supplies than in world demand. World production of high-protein meals is projected to reach 96 million metric tons (44-percent protein basis) in the 1979/80 crop year (October-September), up 13 percent from a year earlier and nearly double the annual growth rate of recent years, according to the U.S. Department of Agriculture (USDA). USDA expects world consumption to expand in the 1979/80 crop year, partly in response to lower prices that may offset other factors that suggest a tempering in demand. These demand-tempering factors are apparent in Europe and the United States, and they are suggested by developments in the U.S. broiler market. Broilers are the leading U.S. consumer of fish meal. Monthly average prices of broilers at the farm were much lower in June-October than either earlier in 1979 or a year earlier. Also costs of broiler production have been increasing. These factors contributed to a weakening in broiler chick placements early in the fourth quarter of 1979 (appendix table A-6), as farmers adjusted to a situation of lower, if not negative, returns in broiler production. However, broiler prices, broiler farm returns, and broiler chick placements improved later in the fourth quarter.

# FISH OIL

## REVIEW: JANUARY-OCTOBER 1979

U.S. Production and Exports High

U.S. production of fish oil totaled 261 million pounds in January-October 1979, 11 percent less than a year earlier when near-record output was achieved, but well above the 1973-77 average (table 4). Production of the dominant menhaden oil was down 11.5 percent compared with a drop of only 2.0 percent for menhaden landings, indicating that oil yields fell a little from those achieved in 1978.

U.S. exports of fish oil account for most of the output, and exports track output reasonably well (fig. 4), allowing for carryover and market factors. High production and carryover for 1978 helped boost U.S. exports in early 1979, before the addition to supplies that

Table 4.--Supply and utilization of fish oil, January-October, 1973-77 average, 1978, and 1979

| Component | 1973-77 average | 1978 | 1979 |
|---|---|---|---|
| | - - - -Million pounds- - - - | | |
| New supplies | | | |
| Production | | | |
| Menhaden 1/ | 184.3 | 282.2 | 249.8 |
| Anchovy | 4.0 | 0.3 | 0.9 |
| Tuna-mackerel | 5.0 | 3.8 | 3.3 |
| Unclassified | 7.8 | 6.6 | 6.9 |
| Total | 201.2 | 293.0 | 260.8 |
| Imports 2/ | na | 12.9 | 11.8 |
| Total | na | 305.8 | 272.6 |
| Use | | | |
| Exports 3/ | 156.0 | 188.9 | 193.1 |
| Domestic use 4/ | 28.5 | 28.9 | 27.6 |
| Total | 184.5 | 217.9 | 220.7 |

1/ May include small quantities made from other species.
2/ Excludes fish liver oils.
3/ May include exports of whale and sperm oil, beginning in 1978.
4/ Use in inedible products only.

Figure 5.--U.S. FISH OIL EXPORTS, MONTHLY, CUMULATIVE, 1973-77 AVERAGE, 1978, AND 1979

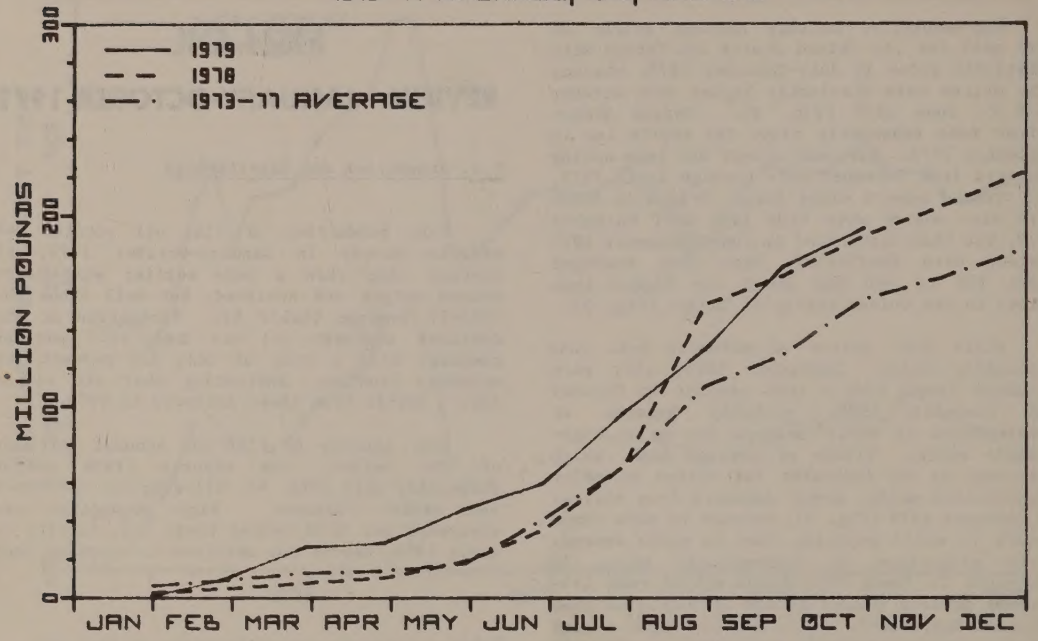
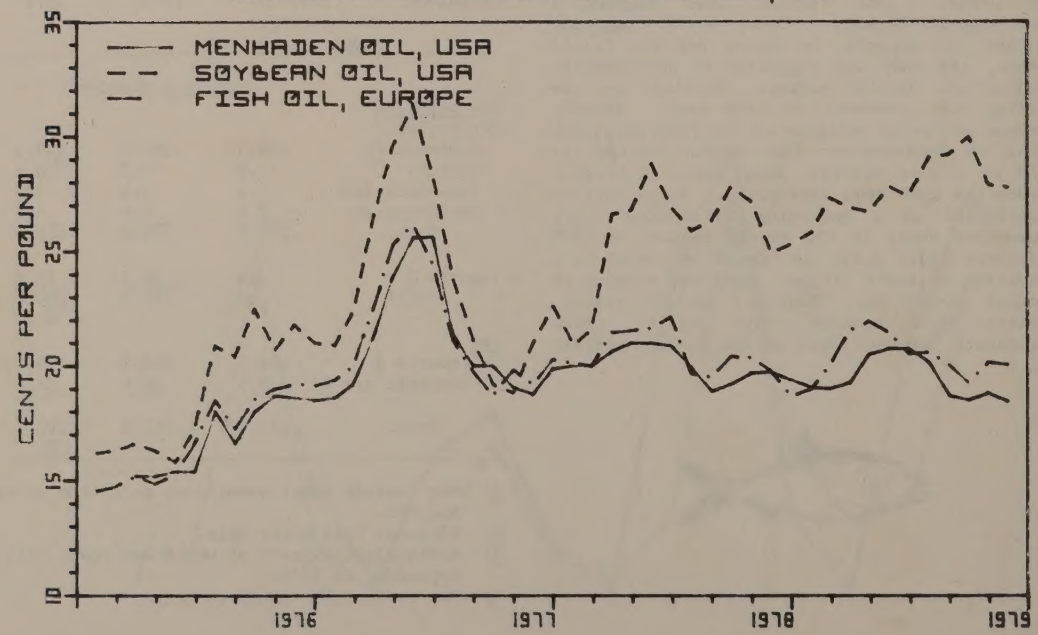



Figure 6.--U.S. PRICES OF FISH OIL AND SOYBEAN OIL, AND EUROPEAN PRICE OF FISH OIL, 1976-79



came with the onset of the main menhaden season. By contrast, low production and carryover for 1977 helped restrain U.S. exports in early 1978. Thus, U.S. exports led year-earlier levels during most of 1979, even though production was down 11 percent through October (fig. 5).

## World Exports Higher

Exports of crude and refined fish oil from nine major supplying countries rose again in 1979, increasing 15 percent compared with 22 percent in 1978 (referring to data for the first 9 months of the year [table 5]). Among these countries, Iceland and Peru had significant increases. One might have expected lower exports of fish oil from Iceland and higher exports from Chile on the basis of data for fish meal. Norway's exports might have been lower without the increased imports of fish oil in 1979 (21,700 metric tons in January-September 1979 vs. 6,500 metric tons a year earlier)--imports were at the highest level since 1974. Comparing 9-month and 12-month data for 1977 and 1978 (table 5), several countries shipped a relatively large amount of fish oil in the fourth quarter, and the 12-month estimates for 1979 assume a repetition of this behavior. Japan was the leading exporter in 1978. Half of Japan's 1978 exports occurred in the fourth quarter, and data for October suggest that the same thing could happen in 1979 (October 1979 exports, 52,500 metric tons; October 1978 exports, 36,700 metric tons).

## Prices Low

U.S. prices of menhaden oil and European prices of fish oil have been lower than prices of soybean oil since early 1978 (fig. 6). World exports of fish oil and supplies of all fats and oils affect the prices of fish oil. Both are high. World exports of fish oil could be about 750,000 metric tons in 1979, if the estimates in table 5 are indicative, or higher, if the nine-country, 9-month rate of increase from 1978 holds (i.e., about 790,000 metric tons). In either case, 1979 exports will probably equal or exceed the 1972 record world exports for fish oil of 750,000 metric tons. This is well above the 550,000 to 600,000 metric tons that prevailed in 1973-77.

World oilseed crops are projected to reach a record 178 million metric tons in the 1979/80 crop year, 12 percent higher than in 1978/79, according to USDA. This high production and demand-dampening factors related to slowing in the economies of the United States and Western Europe may explain the slight lowering of soybean oil prices in the fourth quarter of 1979 (fig. 6).

Table 5.--Exports of fish oil, crude and refined, selected countries; January-September, 1977-79; and annual 1972-76 average, 1977, 1978, and 1979

| Country | Jan.- Sept. | | | Jan.- Dec. | | | |
|---|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1972-76 average | 1977 | 1978 | 1979 estimate |
| | Thousand metric tons | | | | | | |
| Canada | 13 | 8 | 10 | 8 | 16 | 9 | 12 |
| Chile | 18 | 39 | 40 | 13 | 32 | 51 | 55 |
| Denmark | 57 | 51 | 49 | 64 | 74 | 66 | 60 |
| Iceland | 45 | 37 | 58 | 27 | 74 | 73 | 75 |
| Japan | 65 | 105 | 105 | 80 | 107 | 210 | 220 |
| Norway | 102 | 72 | 69 | 106 | 143 | 83 | 85 |
| Peru | - | nil | 41 | 102 | - | nil | 45 |
| S. Africa | - | 14 | 11 | 22 | - | 14 | 14 |
| United States | 38 | 86 | 88 | 92 | 41 | 101 | 100 |
| Subtotal | 336 | 409 | 469 | 514 | 487 | 607 | 666 |
| Other | na | na | na | 92 | 41 | 101 | 100 |
| World total | na | na | na | 606 | 568 | 687 | 746 |

Note: Excludes hardened oil. na: not available. Data may not add to total shown, because of rounding.

Given the price-depressing situation resulting from high world exports of fish oil, high world supplies of all oils and fats, and general economic slowdowns, the prices of fish oil appear to have reasonable strength. Prices of menhaden oil were closer to prices of soybean oil in 1976-77 than in 1978-79 (fig. 6), but the ratio of the two prices in 1976-77 was not necessarily representative.

# OUTLOOK

In 1980, U.S. production of fish meal, solubles, and oil could be high again, and world production and exports are likely to continue to improve. Probable larger increases in world supply than in world demand for all high-protein meals and all fats and oils will affect prices, while costs will be affected by high interest rates, and escalation in prices of fuel and other factors of production.

According to preliminary forecasts by NMFS biologists, landings of menhaden--the dominant raw material in U.S. production of fish meal, solubles, and oil--could be high again in 1980, but probably below the 1978-79 average of 1.15 million metric tons (partially estimated). If actual output from menhaden and other raw materials does not deviate too much from expected patterns, then U.S. total output in 1980 could be as follows: fish meal, 350,000 (± 50,000) short tons; fish solubles, 140,000 (± 20,000) short tons; and fish oil, 265 (± 50) million pounds.

It appears reasonable to expect continued modest growth in world production and exports of fish meal and oil in 1980. Growth in the 1970s was lower than in the 1950s and 1960s. Growth is possible in future decades, but mostly on the basis of resources located away from major producing-exporting countries. Resource constraints continue to plague the major producers. These constraints have resulted from a combination of factors that include: (1) past excessive fishing, (2) cyclical natural phenomena which reduce the stock of harvestable size fish (such as the recurring El Nino off Peru), and (3) national and international fishery management measures to conserve and rebuild fishery resources.

# STATISTICAL APPENDIX

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this department.

TABLE A 1.—FISH MEAL PRODUCTION, IMPORTS, EXPORTS, AND CHICK PLACEMENTS, 1959-78 (1)

| YEAR | FISH MEAL PRODUCTION | | | IMPORTS | | | TOTAL PRODUCTION PLUS IMPORTS | EXPORTS | TOTAL NET SUPPLIES | CHICK PLACEMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | MENHADEN | TUNA AND MACKEREL | TOTAL (2) | FROM PERU | FROM CANADA | TOTAL (2) | | | | |
| | THOUSAND SHORT TONS | | | | | | | | | MILLIONS |
| 1959 | 223.9 | 25.4 | 296.8 | 49.9 | 39.0 | 132.9 | 429.7 | (3) | (3) | 1,632.7 |
| 1960 | 218.4 | 26.5 | 281.4 | 68.2 | 31.0 | 131.6 | 413.0 | (3) | (3) | 1,738.3 |
| 1961 | 247.6 | 21.2 | 300.5 | 151.4 | 38.2 | 217.8 | 518.3 | (3) | (3) | 1,916.5 |
| 1962 | 239.7 | 26.6 | 301.0 | 186.2 | 42.8 | 252.3 | 553.3 | (3) | (3) | 1,993.9 |
| 1963 | 182.4 | 27.0 | 248.0 | 285.4 | 51.0 | 376.3 | 624.3 | (3) | (3) | 2,054.4 |
| 1964 | 160.4 | 21.1 | 225.1 | 348.0 | 54.8 | 439.1 | 664.2 | (3) | (3) | 2,149.6 |
| 1965 | 176.0 | 25.4 | 242.3 | 209.8 | 43.8 | 270.7 | 513.0 | (3) | (3) | 2,368.8 |
| 1966 | 135.0 | 25.3 | 212.4 | 276.6 | 43.6 | 447.8 | 660.2 | (3) | (3) | 2,594.4 |
| 1967 | 119.1 | 25.5 | 201.4 | 442.5 | 46.6 | 651.5 | 852.9 | (3) | (3) | 2,594.8 |
| 1968 | 143.2 | 28.8 | 227.0 | 635.9 | 65.1 | 855.3 | 1,082.3 | (3) | (3) | 2,621.7 |
| 1969 | 159.5 | 26.9 | 244.1 | 218.1 | 67.8 | 358.4 | 602.5 | (3) | (3) | 2,847.1 |
| 1970 | 188.6 | 26.7 | 257.0 | 153.2 | 75.4 | 251.5 | 508.5 | 4.7 | 503.8 | 3,000.9 |
| 1971 | 221.0 | 29.3 | 282.9 | 199.6 | 57.6 | 283.2 | 566.1 | 10.1 | 556.0 | 2,982.2 |
| 1972 | 193.6 | 43.2 | 274.1 | 352.2 | 27.6 | 392.0 | 666.1 | 10.4 | 655.7 | 3,105.2 |
| 1973 | 188.8 | 43.6 | 279.1 | 41.8 | 24.6 | 68.5 | 347.6 | 36.7 | 310.9 | 3,038.3 |
| 1974 | 203.9 | 48.2 | 291.7 | 29.4 | 30.3 | 68.3 | 359.9 | 55.5 | 304.4 | 2,942.8 |
| 1975 | 191.4 | 37.2 | 279.2 | 75.5 | 34.0 | 118.4 | 397.5 | 11.8 | 385.8 | 3,009.0 |
| 1976 | 212.6 | 40.1 | 299.0 | 79.4 | 34.0 | 140.4 | 439.4 | 33.1 | 406.2 | 3,325.8 |
| 1977 | 193.3 | 39.2 | 273.0 | 15.6 | 24.8 | 81.5 | 354.5 | 36.1 | 318.4 | 3,475.4 |
| 1978 | 276.5 | 50.7 | 353.7 | 6.6 | 32.7 | 43.9 | 397.6 | 50.7 | 346.9 | 3,702.7 |

(1) EXCLUDES MEAL MADE FROM SHELLFISH.
(2) TOTAL INCLUDES AMOUNTS FROM OTHER CATEGORIES NOT DETAILED HERE.
(3) NOT AVAILABLE.

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

TABLE A 2.—SUPPLIES OF FISH MEAL IN THE UNITED STATES, BY MONTH, 1973-77 AVERAGE, AND 1978-79

| | PRODUCTION | | | IMPORTS | | | TOTAL NEW SUPPLIES | | | EXPORTS | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 |
| | THOUSAND SHORT TONS | | | | | | | | | | | | | | |
| JANUARY | 5.4 | 5.7 | 7.9 | 4.9 | 3.1 | 10.6 | 10.3 | 8.8 | 18.6 | 3.2 | 0.8 | 0.8 | 7.1 | 8.0 | 17.8 |
| FEBRUARY | 4.4 | 4.8 | 4.9 | 2.9 | 1.5 | 2.2 | 7.4 | 6.4 | 7.1 | 2.8 | 1.8 | 3.8 | 4.6 | 4.6 | 3.4 |
| MARCH | 6.2 | 5.8 | 5.9 | 3.0 | 1.3 | 1.8 | 9.1 | 7.2 | 7.8 | 1.1 | 3.7 | 0.8 | 8.0 | 3.5 | 7.0 |
| 1ST QTR | 16.0 | 16.4 | 18.8 | 10.8 | 5.9 | 14.7 | 26.8 | 22.3 | 33.5 | 7.1 | 6.3 | 5.4 | 19.7 | 16.0 | 28.1 |
| APRIL | 14.0 | 20.1 | 12.1 | 8.3 | 3.0 | 9.2 | 22.2 | 23.1 | 21.3 | 2.1 | 3.9 | 0.3 | 20.1 | 19.2 | 21.0 |
| MAY | 28.1 | 35.5 | 43.3 | 8.1 | 3.5 | 11.8 | 36.2 | 39.1 | 55.2 | 1.2 | 1.2 | 0.3 | 35.0 | 37.8 | 54.9 |
| JUNE | 44.6 | 66.1 | 67.8 | 7.3 | 2.4 | 18.3 | 51.9 | 68.5 | 86.0 | 1.6 | 5.7 | 2.4 | 50.3 | 62.8 | 83.7 |
| 2ND QTR | 86.6 | 121.7 | 123.2 | 23.7 | 9.0 | 39.3 | 110.3 | 130.7 | 162.5 | 4.9 | 10.8 | 3.0 | 105.4 | 119.9 | 159.5 |
| JULY | 54.8 | 58.7 | 61.7 | 11.8 | 5.3 | 3.5 | 66.6 | 63.9 | 65.2 | 2.8 | 6.1 | 2.0 | 63.7 | 57.8 | 63.2 |
| AUGUST | 46.7 | 58.8 | 66.4 | 12.1 | 5.6 | 9.9 | 58.8 | 64.4 | 76.2 | 3.5 | 8.8 | 0.3 | 55.2 | 55.6 | 75.9 |
| SEPTEMBER | 34.6 | 45.2 | 35.5 | 14.2 | 3.4 | 5.7 | 48.9 | 48.6 | 41.2 | 4.5 | 7.5 | 3.1 | 44.4 | 41.0 | 38.0 |
| 3RD QTR | 136.1 | 162.7 | 163.5 | 38.2 | 14.3 | 19.1 | 174.2 | 177.0 | 182.6 | 10.8 | 22.5 | 5.5 | 163.4 | 154.5 | 177.1 |
| OCTOBER | 19.6 | 31.8 | 31.4 | 9.0 | 3.2 | 5.8 | 28.5 | 35.0 | 37.2 | 5.1 | 6.6 | 0.3 | 23.4 | 28.4 | 36.8 |
| NOVEMBER | 13.7 | 10.5 | 9.1 | 11.1 | 2.8 | 8.9 | 24.8 | 13.4 | 18.0 | 1.8 | 3.1 | 0.6 | 23.0 | 10.2 | 17.3 |
| DECEMBER | 12.5 | 10.6 | | 3.2 | 8.7 | | 15.6 | 19.3 | | 4.9 | 1.4 | | 10.7 | 17.9 | |
| 4TH QTR | 45.7 | 52.9 | 40.5 | 23.3 | 14.7 | 14.7 | 68.9 | 67.6 | 55.2 | 11.9 | 11.1 | 1.0 | 57.1 | 56.5 | 54.2 |
| TOTAL | 284.4 | 353.7 | 346.0 | 95.8 | 43.9 | 87.8 | 380.2 | 397.6 | 433.8 | 34.7 | 50.7 | 14.9 | 345.6 | 346.9 | 418.9 |

NOTE: PRODUCTION EXCLUDES MEAL FROM SHELLFISH. 1979 FIGURES ARE PRELIMINARY.
FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

SOURCE: NMFS, RESOURCE STATISTICS DIVISION; BUREAU OF THE CENSUS.

TABLE A 3.—U.S. PRODUCTION OF FISH MEAL BY SPECIES, BY MONTH, 1973-77 AVERAGE, AND 1978-79

| | ANCHOVY | | | MENHADEN | | | TUNA AND MACKEREL | | | UNCLASSIFIED | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 |
| | THOUSAND SHORT TONS | | | | | | | | | | | | | | |
| JANUARY | 1.6 | 0.2 | (1) | 0.3 | 2.0 | 3.4 | 2.5 | 2.4 | 3.5 | 1.0 | 1.1 | 1.0 | 5.4 | 5.7 | 7.9 |
| FEBRUARY | 1.0 | - | - | - | - | - | 2.4 | 2.9 | 3.9 | 1.0 | 1.9 | 1.0 | 4.4 | 4.8 | 4.9 |
| MARCH | 0.9 | (2) | - | - | - | - | 3.8 | 4.0 | 4.5 | 1.5 | 1.8 | 1.4 | 6.2 | 5.8 | 5.9 |
| 1ST QTR | 3.5 | 0.2 | (1) | 0.3 | 2.0 | 3.4 | 8.7 | 9.4 | 11.9 | 3.6 | 4.8 | 3.5 | 16.0 | 16.4 | 18.8 |
| APRIL | 3.1 | (2) | 2.2 | 5.5 | 14.7 | 4.5 | 3.7 | 4.0 | 3.9 | 1.7 | 1.4 | 1.5 | 14.0 | 20.1 | 12.1 |
| MAY | 1.4 | (2) | 4.6 | 21.3 | 29.2 | 31.1 | 3.2 | 4.0 | 4.9 | 2.2 | 2.3 | 2.7 | 28.1 | 35.5 | 43.3 |
| JUNE | - | (3) | 0.9 | 37.9 | 59.6 | 60.8 | 3.6 | 4.0 | 3.5 | 3.1 | 2.4 | 2.7 | 44.6 | 66.1 | 67.8 |
| 2ND QTR | 4.5 | - | 7.6 | 64.7 | 103.6 | 96.4 | 10.4 | 12.0 | 12.3 | 7.0 | 6.2 | 6.9 | 86.6 | 121.7 | 123.2 |
| JULY | - | - | - | 47.6 | 52.2 | 54.2 | 3.8 | 4.1 | 4.0 | 3.3 | 2.4 | 3.5 | 54.8 | 58.7 | 61.7 |
| AUGUST | 0.1 | (3) | (1) | 39.3 | 51.0 | 59.0 | 3.9 | 4.8 | 3.9 | 3.3 | 3.0 | 3.5 | 46.7 | 58.8 | 66.4 |
| SEPTEMBER | 1.3 | (3) | (1) | 27.1 | 37.5 | 28.8 | 3.6 | 5.1 | 3.4 | 2.6 | 2.6 | 3.2 | 34.6 | 45.2 | 35.5 |
| 3RD QTR | 1.5 | - | (1) | 114.1 | 140.7 | 141.9 | 11.3 | 14.0 | 11.3 | 9.2 | 7.9 | 10.3 | 136.1 | 162.7 | 163.5 |
| OCTOBER | 3.5 | 0.5 | 0.6 | 10.3 | 23.8 | 25.7 | 3.9 | 4.7 | 3.1 | 1.9 | 2.7 | 1.9 | 19.6 | 31.8 | 31.4 |
| NOVEMBER | 4.1 | 0.9 | 0.2 | 4.9 | 2.4 | 3.5 | 3.6 | 5.6 | 4.1 | 1.1 | 1.7 | 1.3 | 13.7 | 10.5 | 9.1 |
| DECEMBER | 4.0 | 0.4 | | 3.6 | 4.0 | | 3.7 | 4.9 | | 1.1 | 1.2 | | 12.5 | 10.6 | |
| 4TH QTR | 11.5 | 1.9 | 0.9 | 18.9 | 30.2 | 29.1 | 11.2 | 15.2 | 7.3 | 4.0 | 5.6 | 3.2 | 45.7 | 52.9 | 40.5 |
| TOTAL | 21.0 | 2.1 | 8.5 | 198.0 | 276.5 | 270.9 | 41.7 | 50.6 | 42.7 | 23.8 | 24.5 | 23.8 | 284.4 | 353.7 | 346.0 |

(1) INCLUDED WITH UNCLASSIFIED.
(2) INCLUDED WITH JANUARY.
(3) INCLUDED WITH OCTOBER.

NOTE: PRODUCTION EXCLUDES MEAL FROM SHELLFISH.
FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING. 1979 FIGURES ARE PRELIMINARY.

SOURCE: NMFS, RESOURCE STATISTICS DIVISION.

TABLE A 4.—U.S. IMPORTS OF FISH MEAL BY COUNTRY OF ORIGIN, BY MONTH, 1973-77 AVERAGE, AND 1978-79

| | CANADA | | | NORWAY | | | PERU | | | OTHER COUNTRIES (2) | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 |
| | THOUSAND SHORT TONS | | | | | | | | | | | | | | |
| JANUARY | 1.2 | 1.1 | 1.5 | 0.5 | - | 1.4 | 2.8 | - | 3.5 | 0.3 | 1.9 | 4.3 | 4.9 | 3.1 | 10.6 |
| FEBRUARY | 1.0 | 1.4 | 1.0 | 0.1 | - | 1.2 | 1.8 | - | - | (1) | 0.1 | - | 2.9 | 1.5 | 2.2 |
| MARCH | 1.6 | 1.3 | 1.8 | 0.7 | - | - | - | - | - | 0.7 | - | (1) | 3.0 | 1.3 | 1.8 |
| 1ST QTR | 3.9 | 3.9 | 4.3 | 1.3 | - | 2.6 | 4.6 | - | 3.5 | 1.0 | 2.0 | 4.3 | 10.8 | 5.9 | 14.7 |
| APRIL | 2.4 | 2.9 | 2.7 | 1.6 | - | - | 2.7 | - | 6.3 | 1.5 | 0.1 | 0.2 | 8.3 | 3.0 | 9.2 |
| MAY | 2.4 | 3.5 | 1.5 | 1.1 | - | 2.9 | 3.5 | - | 4.7 | 1.1 | - | 2.7 | 8.1 | 3.5 | 11.8 |
| JUNE | 2.5 | 2.4 | 1.2 | 2.1 | - | 6.3 | 2.3 | - | 6.8 | 0.5 | - | 4.0 | 7.3 | 2.4 | 18.3 |
| 2ND QTR | 7.3 | 8.9 | 5.5 | 4.8 | - | 9.1 | 8.5 | - | 17.8 | 3.1 | 0.1 | 6.9 | 23.7 | 9.0 | 39.3 |
| JULY | 3.4 | 4.0 | 3.5 | 0.7 | - | - | 6.7 | - | - | 1.1 | 1.2 | (1) | 11.8 | 5.3 | 3.5 |
| AUGUST | 3.8 | 4.4 | 4.4 | 0.4 | - | - | 7.0 | - | - | 0.9 | 1.2 | 5.5 | 12.1 | 5.6 | 9.9 |
| SEPTEMBER | 3.7 | 3.4 | 3.0 | 0.7 | - | - | 9.2 | - | - | 0.7 | (1) | 2.8 | 14.2 | 3.4 | 5.7 |
| 3RD QTR | 10.8 | 11.9 | 10.9 | 1.8 | - | - | 22.8 | - | - | 2.7 | 2.5 | 8.2 | 38.2 | 14.3 | 19.1 |
| OCTOBER | 3.8 | 3.2 | 3.1 | 0.8 | - | - | 3.8 | - | - | 0.6 | - | 2.8 | 9.0 | 3.2 | 5.8 |
| NOVEMBER | 2.1 | 2.8 | 2.0 | - | - | - | 8.5 | - | 6.9 | 0.5 | - | - | 11.1 | 2.8 | 8.9 |
| DECEMBER | 1.7 | 2.0 | | 0.7 | - | | - | 6.6 | | 0.8 | - | | 3.2 | 8.7 | |
| 4TH QTR | 7.6 | 8.1 | 5.0 | 1.4 | - | - | 12.4 | 6.6 | 6.9 | 1.9 | - | 2.8 | 23.3 | 14.7 | 14.7 |
| TOTAL | 29.5 | 32.7 | 25.6 | 9.3 | - | 11.8 | 48.3 | 6.6 | 28.2 | 8.7 | 4.6 | 22.1 | 95.8 | 43.9 | 87.8 |

(1) LESS THAN 50 SHORT TONS.
(2) PRINCIPALLY PANAMA IN 1977-79.

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

SOURCE: BUREAU OF THE CENSUS.

TABLE A 5.—U.S. FISH MEAL EXPORTS, ANNUAL, BY COUNTRY OF DESTINATION, 1972-79

| COUNTRY OF DESTINATION | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 JAN.-OCT. |
|---|---|---|---|---|---|---|---|---|
| | SHORT TONS | | | | | | | |
| CANADA | 78 | 2,685 | 2,163 | 3,050 | 1,817 | 2,076 | 525 | 862 |
| DOMINICAN REPUBLIC | 579 | 396 | 690 | 1,309 | 412 | - | 1,160 | 774 |
| GUATEMALA | 206 | 160 | - | - | - | - | - | - |
| MEXICO | 4,759 | 1,264 | 8,533 | - | - | 1,064 | 351 | 435 |
| BELGIUM | - | 865 | - | - | - | - | - | 5 |
| GERMANY, WEST | 2,407 | 21,886 | 33,006 | 3,066 | 17,217 | 22,832 | 29,803 | 851 |
| ITALY | - | - | 275 | - | - | - | 113 | - |
| NETHERLANDS | 270 | 189 | - | - | - | - | - | - |
| SPAIN | 764 | 488 | 466 | - | - | - | - | - |
| UNITED KINGDOM | 409 | 1,689 | 542 | - | - | - | 50 | - |
| YUGOSLAVIA | - | - | 275 | - | - | - | - | - |
| IRAN | - | 4,297 | 1,905 | - | 292 | 220 | 2,122 | - |
| LEBANON | - | - | - | - | - | 210 | - | - |
| SAUDI ARABIA | - | - | - | - | - | 154 | 1,297 | 512 |
| SYRIA | - | - | - | - | 661 | - | - | - |
| TAIWAN | - | - | - | - | - | 1,781 | 94 | 147 |
| EGYPT | - | 928 | 6,063 | 3,274 | 11,530 | 6,120 | 13,903 | 9,741 |
| GHANA | 660 | 1,542 | 506 | 847 | 782 | 711 | 600 | - |
| LIBYA | - | - | 866 | - | - | - | - | - |
| ZAIRE | - | 181 | - | - | - | - | - | - |
| AUSTRALIA | - | 17 | - | - | - | - | 279 | 154 |
| OTHER COUNTRIES | 219 | 145 | 225 | 237 | 430 | 935 | 403 | 753 |
| TOTAL | 10,351 | 36,732 | 55,515 | 11,783 | 33,141 | 36,103 | 50,700 | 14,234 |

SOURCE: BUREAU OF THE CENSUS.

TABLE A 6.—BROILER CHICKS PLACED IN 21 STATES. AND AVERAGE BROILER PRICE AT THE FARM, BY MONTH, 1973-77 AVERAGE, AND 1977-79

| TIME PERIOD | CHICKS PLACED | | | | PERCENTAGE CHANGE IN CHICKS PLACED | | | BROILER PRICE AT THE FARM | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1973-77 AVERAGE | 1977 | 1978 | 1979 | IN 1977 FROM 1973-77 AVG. | IN 1978 FROM 1977 | IN 1979 FROM 1978 | 1977 | 1978 | 1979 |
| | MILLION | | | | PERCENT | | | CENTS/LB | | |
| JANUARY | 261.4 | 282.6 | 300.4 | 327.4 | + 8.1 | + 6.3 | + 9.0 | 21.9 | 22.9 | 27.0 |
| FEBRUARY | 243.6 | 261.3 | 277.2 | 299.4 | + 7.3 | + 6.1 | + 8.0 | 24.3 | 24.8 | 28.9 |
| MARCH | 283.6 | 308.0 | 318.1 | 350.8 | + 8.6 | + 3.3 | + 10.3 | 24.2 | 25.0 | 28.9 |
| 1ST QTR | 788.6 | 851.9 | 895.7 | 977.6 | + 8.0 | + 5.1 | + 9.1 | 23.5 | 24.2 | 28.3 |
| APRIL | 280.3 | 307.3 | 320.1 | 354.1 | + 9.6 | + 4.2 | + 10.6 | 24.2 | 27.8 | 28.2 |
| MAY | 289.0 | 319.3 | 339.7 | 369.7 | + 10.5 | + 6.4 | + 8.8 | 24.1 | 27.8 | 29.0 |
| JUNE | 277.5 | 306.0 | 329.5 | 361.8 | + 10.3 | + 7.7 | + 9.8 | 24.9 | 30.5 | 26.4 |
| 2ND QTR | 846.8 | 932.6 | 989.3 | 1,085.6 | + 10.1 | + 6.1 | + 9.7 | 24.4 | 28.7 | 27.9 |
| JULY | 265.7 | 297.7 | 322.4 | 349.7 | + 12.0 | + 8.3 | + 8.5 | 25.9 | 31.6 | 25.5 |
| AUGUST | 261.8 | 282.3 | 304.2 | 344.0 | + 7.9 | + 7.7 | + 13.1 | 24.1 | 26.2 | 23.0 |
| SEPTEMBER | 241.5 | 268.4 | 283.2 | 306.5 | + 11.1 | + 5.5 | + 8.2 | 23.8 | 26.2 | 23.4 |
| 3RD QTR | 769.0 | 848.4 | 909.7 | 1,000.3 | + 10.3 | + 7.2 | + 10.0 | 24.6 | 28.0 | 24.0 |
| OCTOBER | 243.2 | 278.2 | 295.7 | 306.6 | + 14.4 | + 6.3 | + 3.7 | 22.7 | 24.6 | 21.1 |
| NOVEMBER | 246.1 | 270.7 | 294.7 | 293.4 | + 10.0 | + 8.9 | - 0.4 | 21.3 | 24.5 | 24.6 |
| DECEMBER | 264.5 | 293.6 | 317.6 | 333.3 | + 11.0 | + 8.2 | + 4.9 | 20.2 | 24.9 | 25.2 |
| 4TH QTR | 753.8 | 842.5 | 908.0 | 933.3 | + 11.8 | + 7.8 | + 2.8 | 21.4 | 24.7 | 23.6 |
| TOTAL | 3 158.3 | 3,475.4 | 3,702.7 | 3,996.8 | + 10.0 | + 6.5 | + 7.9 | 23.5 | 26.4 | 25.9 |

FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING. 1978 AND 1979 FIGURES ARE PRELIMINARY.

SOURCES: DELMARVA BROILER CHICK REPORT, U.S. DEPARTMENT OF AGRICULTURE. STATISTICAL REPORTING SERVICE, AND POULTRY AND EGG SITUATION, U.S. DEPARTMENT OF AGRICULTURE, ECONOMIC RESEARCH SERVICE.

TABLE A 7.—SUPPLY AND UTILIZATION OF FISH MEAL IN MAJOR EXPORTING COUNTRIES, JANUARY-DECEMBER 1977 AND 1978

| COUNTRY AND PERIOD | BEGINNING INVENTORY | PRODUCTION | SUBTOTAL | EXPORTS | DOMESTIC CONSUMPTION | ENDING INVENTORY |
|---|---|---|---|---|---|---|
| | | | METRIC TONS | | | |
| 1977 | | | | | | |
| FEO COUNTRIES (1) | | | | | | |
| CHILE | 36,352 | 220,628 | 256,980 | 198,630 | 13,048 | 45,790 |
| ICELAND | 3,665 | 169,558 | 173,223 | 149,204 | 4,800 | 19,118 |
| NORWAY | 139,358 | 464,799 | 604,157 | 450,310 | 25,438 | 128,409 |
| PERU | 148,033 | 452,377 | 600,410 | 394,697 | 113,593 | 89,679 |
| SOUTH AFRICA | 1,908 | 171,400 | 173,308 | 9,165 | 156,870 | 7,273 |
| FEO TOTAL | 329,316 | 1,478,762 | 1,808,078 | 1,202,006 | 313,749 | 290,269 |
| OTHER COUNTRIES | | | | | | |
| CANADA | 3,589 | 44,531 | 48,120 | 27,626 | 16,531 | 4,427 |
| DENMARK | 7,000 | 300,000 | 307,000 | 263,800 | (2) | (2) |
| GRAND TOTAL | 339,905 | 1,823,293 | 2,163,198 | 1,493,432 | (2) | (2) |
| 1978 | | | | | | |
| FEO COUNTRIES (1) | | | | | | |
| CHILE | 45,790 | 327,552 | 373,342 | 289,741 | 11,714 | 72,975 |
| ICELAND | 19,118 | 200,360 | 219,478 | 204,005 | 4,800 | 10,673 |
| NORWAY | 128,409 | 330,479 | 458,888 | 293,840 | 30,521 | 134,527 |
| PERU | 89,679 | 573,893 | 663,572 | 420,171 | 70,012 | 173,389 |
| SOUTH AFRICA | 7,273 | 182,000 | 189,273 | 5,000 | 147,881 | 36,392 |
| FEO TOTAL | 290,269 | 1,614,284 | 1,904,553 | 1,212.757 | 264,928 | 427,956 |
| OTHER COUNTRIES | | | | | | |
| CANADA | 4,427 | 57,832 | 62,259 | 35,565 | 23,556 | 3,480 |
| DENMARK | (2) | 320,000 | (2) | 246,600 | (2) | (2) |
| GRAND TOTAL | (2) | 1,992,116 | (2) | 1,494,922 | (2) | (2) |

(1) EXCLUDING ANGOLA, FOR WHICH COUNTRY FIGURES ARE NOT AVAILABLE.
(2) NOT AVAILABLE.

SOURCE: FISHMEAL EXPORTERS ORGANIZATION (FEO), PARIS; OIL WORLD WEEKLY, PUBLISHED BY ISTA MIELKE & CO., HAMBURG, CANADA, FISHERIES AND OCEANS, OTTAWA AND OTHER SOURCES.

NOTE: FIGURES ARE PRELIMINARY, AND MAY INCLUDE SLIGHT DISCREPANCIES, OWING TO REVISIONS, TO DIFFERENCES IN DEFINITION OR REPORTING PRACTICES AMONG SOURCES AND COUNTRIES, AND TO OTHER POSSIBLE REASONS. FIGURES FOR DENMARK ARE PARTIALLY ESTIMATED.

TABLE A 8.—SUPPLY AND UTILIZATION OF FISH MEAL IN MAJOR EXPORTING COUNTRIES, JANUARY-OCTOBER 1978 AND 1979

| COUNTRY AND PERIOD | BEGINNING INVENTORY | PRODUCTION | SUBTOTAL | EXPORTS | DOMESTIC CONSUMPTION | ENDING INVENTORY |
|---|---|---|---|---|---|---|
| | | | METRIC TONS | | | |
| 1978 | | | | | | |
| FEO COUNTRIES (1) | | | | | | |
| CHILE | 45,790 | 306,069 | 351,859 | 216,746 | 9,788 | 126,892 |
| ICELAND | 19,118 | 173,176 | 192,294 | 155,479 | 4,000 | 32,815 |
| NORWAY | 128,409 | 309,021 | 437,430 | 241,267 | 24,978 | 171,185 |
| PERU | 89,679 | 410,166 | 499,845 | 335,923 | 56,830 | 107,092 |
| SOUTH AFRICA | 7.273 | 182,000 | 189,273 | 2,000 | 118,990 | 68,283 |
| FEO TOTAL | 290,269 | 1,380,432 | 1,670,701 | 951,415 | 214,586 | 506,267 |
| OTHER COUNTRIES | | | | | | |
| CANADA | 4,427 | 51,836 | 56,263 | 30,722 | 19,398 | 6,464 |
| DENMARK | (2) | (2) | (2) | 220,600 | (2) | (2) |
| GRAND TOTAL | (2) | (2) | (2) | 1,202,737 | (2) | (2) |
| 1979 | | | | | | |
| FEO COUNTRIES (1) | | | | | | |
| CHILE | 72,975 | 409,892 | 482,867 | 285,646 | 6,670 | 190,277 |
| ICELAND | 10,673 | 185,023 | 195,696 | 157,823 | 4,000 | 33,345 |
| NORWAY | 134,527 | 310,056 | 444,583 | 282,021 | 29,286 | 132,284 |
| PERU | 187,000 | 479,193 | 666,193 | 491,334 | 52,318 | 101,188 |
| SOUTH AFRICA | 36,392 | 169,481 | 205,873 | 6,928 | 124,095 | 74,850 |
| FEO TOTAL | 441,567 | 1,553,645 | 1,995,212 | 1,223,752 | 216,369 | 531,944 |
| OTHER COUNTRIES | | | | | | |
| CANADA | 3,480 | 46,362 | 49,842 | 23,051 | 21,300 | 5,770 |
| DENMARK | (2) | (2) | (2) | 215,000 | (2) | (2) |
| GRAND TOTAL | (2) | (2) | (2) | 1,461,803 | (2) | (2) |

(1) EXCLUDING ANGOLA, FOR WHICH COUNTRY FIGURES ARE NOT AVAILABLE.
(2) NOT AVAILABLE.

SOURCE: FISHMEAL EXPORTERS ORGANIZATION (FEO), PARIS; OIL WORLD WEEKLY, PUBLISHED BY ISTA MIELKE & CO., HAMBURG; CANADA, FISHERIES AND OCEANS, OTTAWA; AND OTHER SOURCES.

NOTE: FIGURES ARE PRELIMINARY, AND MAY INCLUDE SLIGHT DISCREPANCIES, OWING TO REVISIONS, TO DIFFERENCES IN DEFINITION OR REPORTING PRACTICES AMONG SOURCES AND COUNTRIES, AND TO OTHER POSSIBLE REASONS. FIGURES FOR DENMARK ARE PARTIALLY ESTIMATED.

TABLE A 9.--FEO EXPORTS OF FISH MEAL BY COUNTRY OF DESTINATION, JANUARY-DECEMBER 1977-78

| COUNTRY OF DESTINATION | EXPORTS | | PERCENTAGE OF TOTAL FEO EXPORTS | | PERCENTAGE CHANGE FROM 1977 TO 1978 |
|---|---|---|---|---|---|
| | 1977 | 1978 | 1977 | 1978 | |
| | - THOUSAND METRIC TONS - | | - - - - - - - - - - PERCENT - - - - - - - - - - | | |
| FRANCE | 51.2 | 40.4 | 4.3 | 3.3 | - 21.1 |
| GERMANY, FED. REP. | 180.5 | 216.9 | 15.0 | 17.9 | + 20.2 |
| HOLLAND/BELGIUM | 44.0 | 41.9 | 3.7 | 3.5 | - 4.8 |
| ITALY | 41.8 | 40.5 | 3.5 | 3.3 | - 3.1 |
| PORTUGAL | 9.6 | 10.3 | 0.8 | 0.8 | + 7.3 |
| SWITZERLAND | 10.2 | 8.5 | 0.8 | 0.7 | - 16.7 |
| UNITED KINGDOM | 86.3 | 98.3 | 7.2 | 8.1 | + 13.9 |
| SCANDINAVIAN COUNTRIES | 100.4 | 121.4 | 8.4 | 10.0 | + 20.9 |
| EAST EUROPEAN COUNTRIES | 324.8 | 367.9 | 27.0 | 30.3 | + 13.3 |
| U.S.S.R. | 14.2 | - | 1.2 | - | - 100.0 |
| UNITED STATES | 32.6 | 14.1 | 2.7 | 1.2 | - 56.8 |
| CUBA | 21.4 | 33.5 | 1.8 | 2.8 | + 56.5 |
| OTHER LATIN AMERICAN COUNTRIES | 16.4 | 27.4 | 1.4 | 2.3 | + 67.1 |
| CHINA, P.R. | 5.0 | 14.6 | 0.4 | 1.2 | + 192.0 |
| IRAN | 30.7 | 58.4 | 2.6 | 4.8 | + 90.2 |
| ISRAEL | 20.4 | 13.7 | 1.7 | 1.1 | - 32.9 |
| JAPAN | 146.7 | 31.2 | 12.2 | 2.6 | - 78.7 |
| TAIWAN | 24.7 | 37.1 | 2.1 | 3.1 | + 50.2 |
| OTHER COUNTRIES | 41.18 | 36.65 | 3.4 | 3.0 | - 11.0 |
| TOTAL | 1,202.08 | 1,212.75 | 100.0 | 100.0 | + 0.9 |

NOTE: RECIPIENT COUNTRIES AND CATEGORIES ARE THOSE GIVEN BY FEO.
SOURCE: FISHMEAL EXPORTERS ORGANIZATION (FEO).

TABLE A10.--FEO EXPORTS OF FISH MEAL BY COUNTRY OF DESTINATION, JANUARY-OCTOBER 1978-79

| COUNTRY OF DESTINATION | EXPORTS | | PERCENTAGE OF TOTAL FEO EXPORTS | | PERCENTAGE CHANGE FROM 1978 TO 1979 |
|---|---|---|---|---|---|
| | 1978 | 1979 | 1978 | 1979 | |
| | - THOUSAND METRIC TONS - | | - - - - - - - - - - PERCENT - - - - - - - - - - | | |
| FRANCE | 34.5 | 33.6 | 3.6 | 2.7 | - 2.6 |
| GERMANY, FED. REP. | 158.5 | 214.6 | 16.7 | 17.5 | + 35.4 |
| HOLLAND/BELGIUM | 29.8 | 29.7 | 3.1 | 2.4 | - 0.3 |
| ITALY | 33.0 | 53.8 | 3.5 | 4.4 | + 63.0 |
| PORTUGAL | 9.1 | 8.1 | 1.0 | 0.7 | - 11.0 |
| SWITZERLAND | 7.4 | 9.6 | 0.8 | 0.8 | + 29.7 |
| UNITED KINGDOM | 65.4 | 106.8 | 6.9 | 8.7 | + 63.3 |
| SCANDINAVIAN COUNTRIES | 102.1 | 136.9 | 10.7 | 11.2 | + 34.1 |
| EAST EUROPEAN COUNTRIES | 302.0 | 340.2 | 31.7 | 27.8 | + 12.6 |
| UNITED STATES | - | 40.7 | - | 3.3 | - |
| CUBA | 31.8 | 30.5 | 3.3 | 2.5 | - 4.1 |
| OTHER LATIN AMERICAN COUNTRIES | 20.2 | 28.5 | 2.1 | 2.3 | + 41.1 |
| CHINA, P.R. | 14.6 | 23.1 | 1.5 | 1.9 | + 58.2 |
| IRAN | 50.0 | 30.7 | 5.3 | 2.5 | - 38.6 |
| ISRAEL | 10.3 | 7.8 | 1.1 | 0.6 | - 24.3 |
| JAPAN | 29.2 | 49.12 | 3.1 | 4.0 | + 68.2 |
| KOREA, REP. | 6.1 | 17.2 | 0.6 | 1.4 | + 182.0 |
| PHILIPPINES | 6.5 | 11.0 | 0.7 | 0.9 | + 69.2 |
| TAIWAN | 28.76 | 40.1 | 3.0 | 3.3 | + 39.4 |
| OTHER COUNTRIES | 12.14 | 11.65 | 1.3 | 1.0 | - 3.9 |
| TOTAL | 951.4 | 1,223.67 | 100.0 | 100.0 | + 28.6 |

NOTE: RECIPIENT COUNTRIES AND CATEGORIES ARE THOSE GIVEN BY FEO.
SOURCE: FISHMEAL EXPORTERS ORGANIZATION (FEO).

TABLE A11.--SELECTED AVERAGE MONTHLY WHOLESALE PRICES AND PRICE RATIO OF FISH MEAL TO SOYBEAN MEAL, 1977-79

| | MENHADEN (1) | TUNA-MIX (2) | IMPORTED PERUVIAN (3) | NORTHWEST EUROPE (4) | JAPAN (5) | SOYBEAN (6) | | MENHADEN MEAL TO 50% PROTEIN SOYBEAN MEAL |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 44% PROTEIN | 50% PROTEIN | |
| | DOLLARS PER SHORT TON | | | | | | | PRICE RATIO |
| 1977 | | | | | | | | |
| JANUARY | 412.50 | 323.13 | 404.50 | 423.43 | 413.94 | 207.00 | 224.25 | 1.84 |
| FEBRUARY | 423.75 | 357.50 | 416.66 | 410.05 | 413.18 | 211.00 | 230.38 | 1.84 |
| MARCH | 433.33 | 364.38 | (7) 431.25 | 401.16 | 443.00 | 226.20 | 246.60 | 1.76 |
| APRIL | (7) 483.13 | 367.82 | (7) 479.38 | 438.86 | 477.33 | 275.62 | 299.00 | 1.62 |
| MAY | 486.00 | 390.50 | 482.50 | 458.81 | 471.16 | 258.25 | 283.50 | 1.71 |
| JUNE | 423.75 | 405.97 | 435.00 | 433.09 | 481.70 | 225.30 | 247.10 | 1.71 |
| JULY | 327.50 | 275.00 | 358.75 | 405.29 | 480.17 | 162.00 | 182.75 | 1.79 |
| AUGUST | 318.75 | 247.50 | 325.00 | 346.77 | 473.16 | 140.30 | 160.90 | 1.98 |
| SEPTEMBER | 332.50 | 244.06 | 335.00 | 369.95 | 479.01 | 143.65 | 162.40 | 2.05 |
| OCTOBER | 349.00 | 304.13 | 345.00 | 414.13 | 507.63 | 135.00 | 150.75 | 2.32 |
| NOVEMBER | 363.13 | 275.00 | 358.33 | 419.12 | 520.62 | 161.70 | 177.90 | 2.04 |
| DECEMBER | 366.25 | 288.75 | 365.00 | 420.58 | 476.29 | 160.13 | 175.13 | 2.09 |
| AVERAGE | 393.30 | 320.31 | 394.70 | 411.77 | 469.77 | 192.18 | 211.72 | 1.86 |
| 1978 | | | | | | | | |
| JANUARY | (8) 364.50 | (9) | 366.00 | 409.82 | 447.81 | 162.20 | 175.40 | 2.08 |
| FEBRUARY | (8) 363.33 | (9) | 366.67 | 393.95 | 428.77 | 152.88 | 166.38 | 2.18 |
| MARCH | 370.63 | 330.00 | 385.00 | 393.54 | 485.56 | 179.38 | 193.38 | 1.92 |
| APRIL | 383.33 | 316.25 | 400.00 | 377.62 | 477.45 | 173.00 | 188.75 | 2.03 |
| MAY | 363.50 | 302.50 | (7) 377.50 | 372.40 | 464.08 | 177.40 | 194.90 | 1.87 |
| JUNE | 351.25 | (9) | (9) | 370.50 | 468.07 | 169.75 | 187.13 | 1.88 |
| JULY | 318.50 | 310.75 | (9) | 363.33 | 464.35 | 172.00 | 187.25 | 1.70 |
| AUGUST | 331.25 | 302.50 | (9) | 367.78 | 428.46 | 162.90 | 178.20 | 1.86 |
| SEPTEMBER | 355.00 | 288.75 | (9) | 351.08 | 422.68 | 163.88 | 178.25 | 1.99 |
| OCTOBER | 370.50 | 288.75 | 371.25 | 347.91 | 400.31 | 176.80 | 191.70 | 1.93 |
| NOVEMBER | 383.75 | 288.75 | (9) | 361.43 | 377.93 | 177.13 | 189.50 | 2.03 |
| DECEMBER | 378.75 | 292.19 | 391.67 | 353.50 | 410.17 | 188.75 | 204.50 | 1.85 |
| AVERAGE | 361.19 | 302.27 | 379.73 | 371.90 | 439.64 | 171.34 | 186.28 | 1.94 |
| 1979 | | | | | | | | |
| JANUARY | 377.00 | 346.04 | 390.50 | 345.19 | 385.71 | 184.90 | 200.60 | 1.88 |
| FEBRUARY | 380.00 | 288.75 | (7) 390.00 | 346.09 | 380.60 | 190.75 | 206.63 | 1.84 |
| MARCH | 391.25 | 347.19 | (7) 398.00 | 345.28 | 392.40 | 194.50 | 210.50 | 1.86 |
| APRIL | 401.00 | 343.75 | 410.00 | 331.58 | 461.12 | 191.13 | 207.13 | 1.94 |
| MAY | 380.00 | 343.75 | 388.33 | 333.67 | 470.68 | 188.00 | 205.00 | 1.85 |
| JUNE | 379.38 | 343.75 | 392.50 | 356.53 | 401.17 | 209.63 | 227.63 | 1.67 |
| JULY | 381.00 | 357.50 | (7) 400.83 | 376.03 | 397.57 | 201.60 | 220.90 | 1.72 |
| AUGUST | 359.38 | 320.72 | (7) 391.88 | 362.51 | 396.14 | 188.88 | 205.25 | 1.75 |
| SEPTEMBER | 357.50 | 316.25 | (7) 387.50 | 357.21 | 403.74 | 188.63 | 204.88 | 1.74 |
| OCTOBER | 366.50 | 316.25 | 380.00 | 357.21 | | 181.40 | 197.80 | 1.85 |
| NOVEMBER | 370.63 | 316.25 | (8) 390.00 | 376.30 | | 183.15 | 197.38 | 1.88 |
| DECEMBER | 376.67 | 334.58 | (7) 405.83 | 408.54 | | 188.00 | 205.25 | 1.84 |
| AVERAGE | 376.69 | 331.23 | 393.78 | 358.01 | 409.90 | 190.88 | 207.41 | 1.82 |

(1) 60 PERCENT PROTEIN, BULK, QUOTED BY BROKERS AT NEW YORK CITY, F.O.B., EAST COAST AND GULF PLANTS.
(2) 55 PERCENT PROTEIN, BULK, LOS ANGELES.
(3) 65 PERCENT PROTEIN, BULK, F.O.B., EAST COAST AND GULF PORTS.
(4) 64-65 PERCENT PROTEIN, ANY ORIGIN, C & F, HAMBURG, FEDERAL REPUBLIC OF GERMANY.
(5) THE AVERAGE UNIT VALUE OF IMPORTS INTO JAPAN OF FISH MEAL AND FLOUR, C.I.F., EXCLUDING ANY DUTIES ON IMPORTS IN EXCESS OF QUOTAS, CONVERTED AT THE AVERAGE MONTHLY CURRENCY EXCHANGE RATE.
(6) BULK, DECATUR, ILL.
(7) NOMINAL PRICE.
(8) ASKING PRICE.
(9) NO QUOTES.

SOURCE: FOR PRICES OF FISH MEAL IN THE UNITED STATES: NMFS, RESOURCE STATISTICS DIVISION. FOR NORTHWEST EUROPE PRICES: OIL WORLD, ISTA MIELKE & CO., HAMBURG, FEDERAL REPUBLIC OF GERMANY. FOR SOYBEAN MEAL PRICES: FEED MARKET NEWS, U.S. DEPARTMENT OF AGRICULTURE, CONSUMER AND MARKETING SERVICE, GRAIN DIVISION. FOR JAPANESE PRICES: JAPAN TARIFF ASSOCIATION, JAPAN EXPORTS AND IMPORTS; IMF, INTERNATIONAL FINANCIAL STATISTICS.

TABLE A12.—U.S. SUPPLIES OF FISH SOLUBLES, 1953-78

| YEAR | PRODUCTION | | | IMPORTS | TOTAL SUPPLIES |
|---|---|---|---|---|---|
| | MENHADEN | OTHER | TOTAL | | |
| | THOUSAND SHORT TONS | | | | |
| 1953 | 39.5 | 42.5 | 81.5 | - | 81.5 |
| 1954 | 56.3 | 58.8 | 115.0 | 3.6 | 118.6 |
| 1955 | 61.9 | 49.0 | 110.9 | 3.3 | 114.2 |
| 1956 | 72.9 | 56.0 | 128.8 | 3.0 | 131.8 |
| 1957 | 69.4 | 52.9 | 122.3 | 9.7 | 132.0 |
| 1958 | 72.5 | 57.7 | 130.2 | 14.6 | 144.8 |
| 1959 | 108.1 | 57.3 | 165.4 | 26.6 | 192.0 |
| 1960 | 65.8 | 33.1 | 98.9 | 3.2 | 102.1 |
| 1961 | 73.3 | 38.9 | 112.2 | 6.7 | 119.0 |
| 1962 | 85.2 | 39.4 | 124.6 | 6.3 | 130.9 |
| 1963 | 74.8 | 32.6 | 107.4 | 7.1 | 114.5 |
| 1964 | 68.7 | 24.6 | 93.3 | 4.5 | 97.8 |
| 1965 | 73.2 | 21.7 | 94.8 | 5.1 | 100.0 |
| 1966 | 60.8 | 22.7 | 83.4 | 4.3 | 87.7 |
| 1967 | 51.8 | 22.9 | 74.7 | 3.7 | 78.3 |
| 1968 | 53.2 | 18.6 | 71.8 | 1.8 | 73.6 |
| 1969 | 63.3 | 18.4 | 81.7 | 0.2 | 81.8 |
| 1970 | 71.9 | 23.1 | 95.0 | 0.5 | 95.4 |
| 1971 | 91.5 | 19.7 | 111.2 | 0.1 | 111.2 |
| 1972 | 104.1 | 30.3 | 134.4 | 0.1 | 134.5 |
| 1973 | 104.4 | 33.1 | 137.4 | 0.3 | 137.7 |
| 1974 | 102.9 | 34.3 | 137.3 | - | 137.3 |
| 1975 | 83.6 | 44.2 | 127.8 | 0.1 | 127.9 |
| 1976 | 95.3 | 37.8 | 133.1 | 1.2 | 134.3 |
| 1977 | 87.4 | 34.9 | 122.3 | 0.8 | 123.2 |
| 1978 | 132.0 | 30.5 | 162.5 | - | 162.5 |

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING; IMPORTS NOT REPORTED SEPARATELY IN 1978.

TABLE A13.--PRODUCTION AND AVERAGE PRICE OF FISH SOLUBLES, BY MONTH, 1973-77 AVERAGE AND 1977-79

| | PRODUCTION | | | | PRICE (1) | | | MENHADEN SOLUBLES TO MENHADEN MEAL | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1973-77 AVERAGE | 1977 | 1978 | 1979 | 1977 | 1978 | 1979 | 1977 | 1978 | 1979 |
| | THOUSAND SHORT TONS | | | | DOLLARS PER SHORT TON | | | PRICE RATIO | | |
| JANUARY | 2.0 | 1.2 | 2.2 | 4.4 | (2)140.00 | (2)135.50 | 121.50 | 0.34 | 0.37 | 0.32 |
| FEBRUARY | 1.5 | 1.7 | 1.7 | 1.6 | (2)144.38 | (2)137.50 | 122.50 | 0.34 | 0.38 | 0.32 |
| MARCH | 2.9 | 3.6 | 1.9 | 2.4 | (2)147.50 | (2)137.50 | 123.13 | 0.34 | 0.37 | 0.31 |
| 1ST QTR | 6.3 | 6.5 | 5.8 | 8.3 | 143.96 | 136.83 | 122.38 | 0.34 | 0.37 | 0.32 |
| APRIL | 7.3 | 8.9 | 8.8 | 5.1 | (2)166.88 | (2)142.50 | 124.00 | 0.35 | 0.37 | 0.31 |
| MAY | 12.9 | 10.7 | 13.0 | 17.9 | (2)177.00 | 145.50 | 121.25 | 0.36 | 0.40 | 0.32 |
| JUNE | 20.0 | 18.2 | 24.9 | 26.2 | (2)176.25 | 145.00 | 118.75 | 0.42 | 0.41 | 0.31 |
| 2ND QTR | 40.2 | 37.8 | 46.8 | 49.3 | 173.38 | 144.33 | 121.33 | 0.38 | 0.39 | 0.31 |
| JULY | 23.8 | 18.6 | 26.2 | 21.6 | (2)149.38 | 129.50 | 123.00 | 0.46 | 0.41 | 0.32 |
| AUGUST | 21.4 | 18.3 | 33.0 | 23.0 | (2)128.50 | 126.25 | 125.00 | 0.40 | 0.38 | 0.35 |
| SEPTEMBER | 16.5 | 19.2 | 26.2 | 13.0 | (2)131.25 | 131.25 | 121.25 | 0.39 | 0.37 | 0.34 |
| 3RD QTR | 61.7 | 56.2 | 85.3 | 57.6 | 136.38 | 129.00 | 123.08 | 0.42 | 0.39 | 0.34 |
| OCTOBER | 10.6 | 11.1 | 13.7 | 13.3 | (2)126.00 | 132.50 | 116.50 | 0.36 | 0.36 | 0.32 |
| NOVEMBER | 7.5 | 6.1 | 6.2 | 4.8 | (2)127.50 | 131.25 | 111.25 | 0.35 | 0.34 | 0.30 |
| DECEMBER | 5.2 | 4.6 | 4.7 | | (2)133.75 | 126.25 | 106.67 | 0.37 | 0.33 | 0.28 |
| 4TH QTR | 23.3 | 21.8 | 24.6 | 18.0 | 129.08 | 130.00 | 111.47 | 0.36 | 0.34 | 0.30 |
| TOTAL | 131.6 | 122.3 | 162.5 | 133.3 | 145.70 | 135.04 | 119.57 | 0.37 | 0.37 | 0.32 |

(1) MENHADEN SOLUBLES IN TANK CARS PRICE QUOTED BY BROKERS AT NEW YORK CITY, F.O.B. EAST COAST PLANTS.
(2) NOMINAL PRICE.

NOTE: FIGURES MAY NOT SUM TO TOTAL BECAUSE OF ROUNDING. 1979 FIGURES SUBJECT TO REVISION.

SOURCE: NMFS, RESOURCE STATISTICS DIVISION.

TABLE A14.—FISH OIL PRODUCTION, IMPORTS, EXPORTS, DOMESTIC USE, AND APPARENT STOCK CHANGES, 1950-78

| | U.S. PRODUCTION (1) | | | | | IMPORTS (2) | TOTAL SUPPLIES (3) | EXPORTS (4) | U.S. INDUSTRIAL UTILIZATION (2) | NET CHANGES IN STOCKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | MENHADEN | TUNA AND MACKEREL | HERRING | OTHER | TOTAL | | | | | |
| | MILLION POUNDS | | | | | | | | | |
| 1950 | 76.6 | 6.6 | 24.8 | 52.7 | 160.7 | 15.1 | 175.9 | 76.0 | (5) | (5) |
| 1951 | 94.0 | 5.3 | 11.3 | 22.9 | 133.5 | 17.4 | 150.9 | 49.8 | (5) | (5) |
| 1952 | 96.7 | 5.6 | 8.1 | 8.2 | 118.6 | 15.6 | 134.2 | 44.0 | (5) | (5) |
| 1953 | 133.7 | 4.9 | 5.4 | 6.7 | 150.7 | 12.0 | 162.6 | 108.5 | (5) | (5) |
| 1954 | 139.8 | 4.4 | 5.7 | 12.3 | 162.2 | 13.0 | 175.2 | 141.6 | (5) | (5) |
| 1955 | 159.2 | 4.1 | 8.2 | 13.6 | 185.1 | 10.4 | 195.5 | 142.7 | 74.9 | - 22.1 |
| 1956 | 168.2 | 5.3 | 13.7 | 10.1 | 197.3 | 10.7 | 207.9 | 140.9 | 81.3 | - 14.2 |
| 1957 | 118.5 | 5.5 | 14.1 | 10.1 | 148.2 | 7.2 | 155.4 | 114.9 | 83.0 | - 42.5 |
| 1958 | 128.0 | 4.7 | 13.2 | 15.7 | 161.6 | 4.9 | 166.6 | 94.0 | 67.5 | + 5.1 |
| 1959 | 154.7 | 4.5 | 15.0 | 9.0 | 183.2 | 6.8 | 189.9 | 144.5 | 58.6 | - 13.2 |
| 1960 | 183.4 | 3.8 | 11.5 | 6.9 | 205.6 | 8.9 | 214.8 | 143.7 | 56.8 | + 14.1 |
| 1961 | 235.2 | 5.7 | 6.1 | 7.6 | 254.6 | 8.4 | 263.0 | 122.5 | 64.8 | + 75.7 |
| 1962 | 232.6 | 5.0 | 5.1 | 4.8 | 247.5 | 10.8 | 258.2 | 123.0 | 62.9 | + 72.3 |
| 1963 | 167.6 | 5.9 | 5.7 | 4.5 | 183.7 | 8.6 | 192.2 | 262.3 | 52.1 | -122.2 |
| 1964 | 157.7 | 4.8 | 10.3 | 4.2 | 177.0 | 11.8 | 188.8 | 151.5 | 47.7 | - 10.4 |
| 1965 | 175.2 | 4.8 | 8.5 | 4.3 | 192.8 | 6.0 | 198.7 | 103.8 | 44.5 | + 50.4 |
| 1966 | 144.2 | 4.1 | 7.9 | 6.5 | 162.7 | 12.7 | 175.3 | 77.3 | 38.8 | + 59.2 |
| 1967 | 101.4 | 5.2 | 5.7 | 7.6 | 119.9 | 7.0 | 126.9 | 76.8 | 35.8 | + 14.3 |
| 1968 | 152.0 | 4.5 | 9.5 | 5.7 | 171.7 | 5.9 | 177.6 | 65.1 | 30.0 | + 82.5 |
| 1969 | 149.2 | 4.2 | 3.5 | 11.1 | 168.0 | 4.2 | 172.2 | 196.1 | 34.1 | - 58.0 |
| 1970 | 186.3 | 3.5 | 3.4 | 10.9 | 206.1 | 5.5 | 211.6 | 158.8 | 31.4 | + 21.4 |
| 1971 | 244.0 | 4.9 | 5.9 | 10.2 | 265.0 | 7.5 | 272.5 | 229.9 | 26.5 | + 16.1 |
| 1972 | 167.0 | 5.0 | 5.1 | 11.3 | 188.4 | 9.4 | 197.9 | 193.2 | 29.8 | - 34.5 |
| 1973 | 200.5 | 7.4 | 1.7 | 15.0 | 224.6 | 6.7 | 231.4 | 247.8 | 26.5 | - 42.9 |
| 1974 | 217.0 | 5.8 | (6) | 14.1 | 238.0 | 12.4 | 250.3 | 199.1 | 35.0 | + 16.2 |
| 1975 | 213.3 | 6.4 | (6) | 25.9 | 245.7 | 11.3 | 256.9 | 191.8 | 36.8 | + 28.3 |
| 1976 | 186.4 | 6.3 | (6) | 11.8 | 204.6 | 20.9 | 225.5 | 179.2 | 38.4 | + 7.8 |
| 1977 | 116.1 | 3.8 | (6) | 13.2 | 133.2 | 13.7 | 146.9 | 90.6 | 35.4 | + 20.8 |
| 1978 | 284.0 | 4.4 | (6) | 7.9 | 296.3 | 16.0 | 312.3 | 222.0 | 33.8 | + 56.5 |

(1) EXCLUDES WHALE AND SPERM OILS.
(2) EXCLUDES LIVER, WHALE, AND SPERM OILS.
(3) PRODUCTION PLUS IMPORTS.
(4) DOES NOT INCLUDE EXPORTS OF FOREIGN MERCHANDISE.
(5) NOT AVAILABLE.
(6) INCLUDED WITH OTHER.

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

TABLE A15.—U.S. PRODUCTION OF FISH OIL BY SPECIES, BY MONTH, 1973-77 AVERAGE, AND 1978-79

| | ANCHOVY | | | MENHADEN | | | TUNA AND MACKEREL | | | UNCLASSIFIED | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 | 1973-77 AVERAGE | 1978 | 1979 |
| | MILLION POUNDS | | | | | | | | | | | | | | |
| JANUARY | 0.5 | 0.1 | (1) | (2) | 0.1 | 0.8 | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 1.1 | 0.7 | 1.1 |
| FEBRUARY | 0.1 | - | (1) | - | - | - | 0.3 | 0.3 | 0.2 | 0.2 | 0.3 | 0.2 | 0.6 | 0.6 | 0.4 |
| MARCH | 0.1 | (3) | - | - | - | - | 0.5 | 0.2 | 0.3 | 0.2 | 0.3 | 0.3 | 0.8 | 0.5 | 0.6 |
| 1ST QTR | 0.7 | 0.1 | (1) | (2) | 0.1 | 0.8 | 1.1 | 0.8 | 0.7 | 0.6 | 0.9 | 0.7 | 2.5 | 1.8 | 2.2 |
| APRIL | 0.3 | - | (1) | 4.8 | 16.1 | 3.1 | 0.5 | 0.3 | 0.2 | 0.3 | 0.2 | 0.2 | 6.0 | 16.6 | 3.6 |
| MAY | 0.2 | (4) | 0.3 | 22.7 | 29.4 | 30.0 | 0.4 | 0.5 | 0.5 | 0.7 | 0.5 | 0.4 | 24.0 | 30.4 | 31.2 |
| JUNE | - | (4) | (1) | 35.7 | 61.4 | 56.4 | 0.5 | 0.3 | 0.3 | 1.0 | 0.6 | 0.8 | 37.2 | 62.3 | 57.4 |
| 2ND QTR | 0.4 | - | 0.3 | 63.2 | 107.0 | 89.5 | 1.4 | 1.0 | 1.0 | 2.0 | 1.3 | 1.4 | 67.1 | 109.3 | 92.2 |
| JULY | - | - | - | 44.8 | 50.7 | 43.5 | 0.5 | 0.4 | 0.4 | 1.6 | 1.6 | 1.4 | 47.0 | 52.7 | 45.3 |
| AUGUST | 0.1 | (4) | - | 38.6 | 57.9 | 63.2 | 0.6 | 0.6 | 0.4 | 1.3 | 1.2 | 1.4 | 40.6 | 59.8 | 65.0 |
| SEPTEMBER | 1.0 | 0.2 | (1) | 27.7 | 42.6 | 30.3 | 0.6 | 0.6 | 0.4 | 1.3 | 1.0 | 1.8 | 30.6 | 44.4 | 32.5 |
| 3RD QTR | 1.0 | 0.2 | (1) | 111.1 | 151.3 | 137.0 | 1.8 | 1.5 | 1.2 | 4.2 | 3.9 | 4.6 | 118.1 | 156.9 | 142.7 |
| OCTOBER | 1.8 | - | 0.5 | 10.0 | 23.9 | 22.4 | 0.7 | 0.4 | 0.3 | 1.0 | 0.6 | 0.4 | 13.5 | 24.9 | 23.6 |
| NOVEMBER | 2.3 | 0.3 | (1) | 1.6 | 0.7 | 1.4 | 0.6 | 0.3 | 0.5 | 0.3 | 0.4 | 0.5 | 4.8 | 1.7 | 2.5 |
| DECEMBER | 1.7 | 0.2 | | 0.7 | 1.1 | | 0.5 | 0.3 | | 0.2 | 0.1 | | 3.2 | 1.6 | |
| 4TH QTR | 5.9 | 0.4 | 0.5 | 12.4 | 25.7 | 23.8 | 1.9 | 1.0 | 0.9 | 1.4 | 1.1 | 0.9 | 21.5 | 28.3 | 26.0 |
| TOTAL | 8.1 | 0.8 | 0.8 | 186.7 | 284.0 | 251.0 | 6.2 | 4.4 | 3.8 | 8.3 | 7.1 | 7.5 | 209.2 | 296.3 | 263.1 |

(1) INCLUDED WITH UNCLASSIFIED.
(2) LESS THAN 50,000 POUNDS.
(3) INCLUDED WITH JANUARY.
(4) INCLUDED WITH SEPTEMBER.

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.
1979 FIGURES SUBJECT TO REVISION.

SOURCE: NMFS, RESOURCE STATISTICS DIVISION.

TABLE A16.—U.S. EXPORTS, DOMESTIC INDUSTRIAL USE, AND TOTAL DISAPPEARANCE OF FISH OIL, BY MONTH, 1973-77 AVERAGE, AND 1977-79

| | EXPORTS (1) | | | | DOMESTIC DISAPPEARANCE (2) | | | | TOTAL DISAPPEARANCE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1973-77 AVERAGE | 1977 | 1978 | 1979 | 1973-77 AVERAGE | 1977 | 1978 | 1979 | 1973-77 AVERAGE | 1977 | 1978 | 1979 |
| | MILLION POUNDS | | | | | | | | | | | |
| JANUARY | 6.3 | 0.7 | 2.5 | 1.0 | 2.4 | 2.2 | 3.1 | 3.3 | 8.8 | 2.9 | 5.7 | 4.3 |
| FEBRUARY | 2.9 | 1.0 | 2.4 | 8.5 | 2.5 | 2.7 | 2.0 | 1.9 | 5.4 | 3.7 | 4.4 | 10.5 |
| MARCH | 3.8 | 3.7 | 2.9 | 17.0 | 2.6 | 3.3 | 2.3 | 2.9 | 6.4 | 7.0 | 5.2 | 19.9 |
| 1ST QTR | 12.9 | 5.4 | 7.8 | 26.6 | 7.6 | 8.1 | 7.5 | 8.0 | 20.5 | 13.6 | 15.2 | 34.6 |
| APRIL | 1.2 | (3) | 2.8 | 2.3 | 2.9 | 3.2 | 2.8 | 2.9 | 4.1 | 3.2 | 5.6 | 5.2 |
| MAY | 3.9 | 1.5 | 8.5 | 17.5 | 2.9 | 3.3 | 3.0 | 3.0 | 6.8 | 4.8 | 11.5 | 20.5 |
| JUNE | 22.9 | 15.0 | 16.1 | 13.5 | 2.8 | 2.6 | 2.7 | 3.2 | 25.7 | 17.7 | 18.8 | 16.7 |
| 2ND QTR | 28.0 | 16.6 | 27.4 | 33.2 | 8.5 | 9.1 | 8.4 | 9.1 | 36.5 | 25.6 | 35.8 | 42.4 |
| JULY | 27.6 | 16.1 | 33.7 | 37.3 | 2.7 | 2.8 | 3.8 | 2.5 | 30.3 | 18.9 | 37.5 | 39.9 |
| AUGUST | 41.6 | 31.5 | 84.2 | 32.4 | 3.5 | 3.0 | 3.0 | 3.2 | 45.2 | 34.6 | 87.1 | 35.6 |
| SEPTEMBER | 16.7 | 5.7 | 15.1 | 43.6 | 3.3 | 3.4 | 3.2 | 2.2 | 20.0 | 9.0 | 18.3 | 45.8 |
| 3RD QTR | 86.0 | 53.3 | 133.0 | 113.3 | 9.5 | 9.2 | 9.9 | 7.9 | 95.5 | 62.5 | 143.0 | 121.2 |
| OCTOBER | 29.1 | 6.9 | 20.8 | 20.0 | 2.9 | 2.4 | 3.1 | 2.5 | 32.0 | 9.3 | 23.9 | 22.6 |
| NOVEMBER | 11.4 | 3.3 | 15.7 | 0.1 | 3.1 | 3.9 | 2.3 | 3.1 | 14.5 | 7.2 | 18.0 | 3.2 |
| DECEMBER | 14.3 | 5.1 | 17.4 | | 2.6 | 2.8 | 2.6 | | 16.9 | 7.8 | 20.0 | |
| 4TH QTR | 54.8 | 15.3 | 53.8 | 20.1 | 8.6 | 9.1 | 8.0 | 5.6 | 63.5 | 24.4 | 61.9 | 25.7 |
| TOTAL | 181.7 | 90.6 | 222.0 | 193.2 | 34.2 | 35.4 | 33.8 | 30.7 | 216.0 | 126.1 | 255.8 | 223.9 |

(1) BEGINNING IN JANUARY 1978, MAY INCLUDE EXPORTS OF WHALE AND SPERM OIL.
(2) INCLUDES MARINE MAMMAL OIL OTHER THAN SPERM OIL AND SOME HYDROGENATED FAT (VEGETABLE AND ANIMAL) AND OTHER FATS AND OILS IN PROCESS.
(3) LESS THAN 50,000 POUNDS.

SOURCE: BUREAU OF THE CENSUS. CURRENT INDUSTRIAL REPORT, FATS AND OILS, PRODUCTION CONSUMPTION AND STOCKS, SERIES: M20K(73-79).

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

TABLE A17.—U.S. FISH OIL EXPORTS, ANNUAL, BY COUNTRY OF DESTINATION, 1972-79

| COUNTRY OF DESTINATION | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 JAN.-OCT. |
|---|---|---|---|---|---|---|---|---|
| | SHORT TONS | | | | | | | |
| CANADA | 2,578 | 1,181 | 1,255 | 1,241 | 191 | 312 | 639 | 229 |
| MEXICO | 124 | 195 | 309 | 198 | 269 | 284 | 303 | 355 |
| PANAMA | 68 | - | - | - | - | - | 4 | 2 |
| ARGENTINA | - | - | - | - | - | 402 | 41 | 9 |
| COLOMBIA | - | 10,667 | 8,846 | - | 26,598 | 5,576 | 18,302 | 21,438 |
| BELGIUM/LUXEMBOURG | 2,250 | 1,212 | - | 4,797 | 11,305 | 1,102 | 5,584 | 17,717 |
| DENMARK | 2,425 | - | - | - | - | - | - | - |
| FRANCE | - | 8 | - | - | - | 1,921 | 1,987 | 1,876 |
| GERMANY, WEST | 26,250 | 5,511 | 11,467 | 12,080 | 13,855 | 13,968 | 45,042 | 13,820 |
| ITALY | - | - | - | - | 285 | - | - | 2 |
| NETHERLANDS | 82,220 | 146,386 | 147,067 | 55,408 | 82,905 | 52,554 | 81,968 | 71,409 |
| NORWAY | 9,171 | - | 11,038 | - | 1,323 | 2,200 | 1,125 | 493 |
| SWEDEN | 61,558 | 37,980 | 13,889 | 41,577 | 2,212 | 3,272 | 8,745 | 11,745 |
| UNITED KINGDOM | 11 | 41,388 | 4,122 | 74,628 | 34,088 | 7,938 | 50,600 | 45,047 |
| JAPAN | 49 | 22 | - | - | - | - | 251 | - |
| LEBANON | 1,212 | 2 583 | 442 | 1,342 | - | - | 2 | - |
| SOUTH AFRICA | 4,590 | - | - | - | 5,176 | - | - | - |
| AUSTRALIA | 535 | 583 | 561 | - | 664 | 696 | 7 | 882 |
| OTHER COUNTRIES | 157 | 77 | 125 | 572 | 364 | 408 | 7,410 | 7,999 |
| TOTAL | 193,198 | 247,793 | 199,122 | 191,843 | 179,235 | 90,633 | 222,012 | 193,122 |

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

SOURCE: BUREAU OF THE CENSUS.

TABLE A18.—SELECTED AVERAGE MONTHLY PRICES OF FISH AND SOYBEAN OILS, AND PRICE RATIO OF MENHADEN OIL TO SOYBEAN OIL, 1977-79

| | ANCHOVY (1) | MENHADEN (2) | TUNA (3) | NORTHWEST EUROPE (4) | SOYBEAN (5) | MENHADEN OIL TO SOYBEAN OIL |
|---|---|---|---|---|---|---|
| | CENTS PER POUND | | | | | PRICE RATIO |
| 1977 | | | | | | |
| JANUARY | 14.00 | 18.60 | 9.30 | 19.39 | 20.90 | 0.89 |
| FEBRUARY | 14.00 | 19.19 | 9.50 | 20.00 | 22.40 | 0.86 |
| MARCH | 14.00 | 21.25 | 9.38 | 22.54 | 26.50 | 0.80 |
| APRIL | 14.00 | 23.88 | 9.50 | 25.31 | 29.60 | 0.81 |
| MAY | 14.00 | 25.60 | 9.50 | 26.17 | 31.30 | 0.82 |
| JUNE | (6) | 25.63 | 12.00 | 24.45 | 28.30 | 0.91 |
| JULY | (6) | 21.38 | 12.38 | 21.11 | 23.80 | 0.90 |
| AUGUST | (6) | 20.00 | 12.50 | 19.73 | 21.10 | 0.95 |
| SEPTEMBER | (6) | 20.00 | 12.63 | 18.69 | 19.20 | 1.04 |
| OCTOBER | 15.13 | 19.05 | 12.80 | 19.84 | 18.80 | 1.01 |
| NOVEMBER | 15.50 | 18.75 | 11.00 | 19.16 | 21.00 | 0.89 |
| DECEMBER | 15.50 | 19.88 | 10.50 | 20.28 | 22.60 | 0.88 |
| AVERAGE | 14.52 | 21.10 | 10.92 | 21.39 | 23.79 | 0.89 |
| 1978 | | | | | | |
| JANUARY | (6) | 20.00 | (6) | 20.13 | 20.90 | 0.96 |
| FEBRUARY | (6) | 20.00 | (6) | 20.01 | 21.60 | 0.93 |
| MARCH | (6) | 20.63 | (6) | 21.46 | 26.60 | 0.78 |
| APRIL | (6) | 21.00 | (6) | 21.55 | 26.80 | 0.78 |
| MAY | (6) | 21.00 | (6) | 21.66 | 28.80 | 0.73 |
| JUNE | (6) | 20.88 | (6) | 22.14 | 26.90 | 0.78 |
| JULY | (6) | 19.95 | (6) | 19.67 | 25.90 | 0.77 |
| AUGUST | (6) | 18.88 | (6) | 19.50 | 26.30 | 0.72 |
| SEPTEMBER | (6) | 19.19 | 10.50 | 20.41 | 27.80 | 0.69 |
| OCTOBER | (6) | 19.70 | 10.50 | 20.36 | 27.17 | 0.73 |
| NOVEMBER | (6) | 19.75 | 10.75 | 19.78 | 24.91 | 0.79 |
| DECEMBER | (6) | 19.38 | 10.75 | 18.67 | 25.30 | 0.77 |
| AVERAGE | - | 20.03 | 10.63 | 20.44 | 25.75 | 0.78 |
| 1979 | | | | | | |
| JANUARY | (6) | 19.05 | 11.00 | 18.99 | 25.80 | 0.74 |
| FEBRUARY | (6) | 19.00 | 11.00 | 20.01 | 27.30 | 0.70 |
| MARCH | (6) | 19.25 | 11.00 | 21.55 | 26.90 | 0.72 |
| APRIL | (6) | 20.50 | 11.40 | 21.94 | 26.70 | 0.77 |
| MAY | (6) | 20.75 | 11.50 | 21.44 | 27.80 | 0.75 |
| JUNE | (6) | 20.75 | 11.44 | 20.53 | 27.41 | 0.76 |
| JULY | (6) | 20.15 | 11.50 | 20.58 | 29.07 | 0.69 |
| AUGUST | (6) | 18.69 | 11.50 | 20.05 | 29.21 | 0.64 |
| SEPTEMBER | (6) | 18.50 | 11.50 | 19.28 | 29.97 | 0.62 |
| OCTOBER | (6) | 18.80 | 11.50 | 20.13 | 27.89 | 0.67 |
| NOVEMBER | (6) | 18.44 | 11.88 | 20.05 | 27.79 | 0.66 |
| DECEMBER | (6) | 18.75 | 11.83 | 20.22 | 26.20 | 0.72 |
| AVERAGE | - | 19.39 | 11.42 | 20.40 | 27.67 | 0.70 |

(1) CRUDE OIL, F.O.B. PLANTS, QUOTED AT LOS ANGELES.
(2) CRUDE OIL, TANK CARS, F.O.B. EAST COAST PLANTS, QUOTED AT NEW YORK CITY.
(3) CRUDE OIL, F.O.B. PLANTS, QUOTED AT LOS ANGELES.
(4) CRUDE OIL, ANY ORIGIN, C.I.F. NORTHWEST EUROPE, QUOTED AT HAMBURG.
(5) CRUDE OIL, TANK CARS, F.O.B., DECATUR, ILL.
(6) SUPPLIES EXHAUSTED, NO QUOTES.

SOURCE: FOR U.S. PRICES: NMFS, RESOURCE STATISTICS DIVISION.
FOR NW. EUROPE PRICES: OIL WORLD, ISTA MIELKE & CO., HAMBURG, FEDERAL REPUBLIC OF GERMANY.
FOR SOYBEAN OIL PRICES: FATS AND OILS SITUATION, U.S. DEPARTMENT OF AGRICULTURE.

**U.S. DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
National Marine Fisheries Service, F21
Washington, D.C. 20235

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM - 210
Third Class Bulk Rate

NOTICE: To stop mailing ☐, or to change your address ☐, send mailing label on this report and new address to:

Market Analysis Group
NOAA/NMFS/F21
Washington, D.C. 20235

9896812 020 D 0978 01
LIBRARY
NMFS
PO BOX 3830
HONOLULU HI 96812

NOAA--S/T 80-79